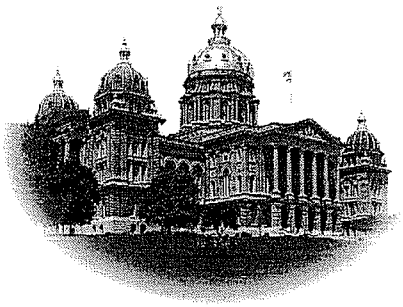

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September 17, 2004

MEMORANDUM

TO: Temporary Co-Chairpersons Senator Jeff Angelo and Representative Carmine Boal and Members of the Iowa Learning Technology Committee

FROM: Kathy Hanlon, Senior Research Analyst

RE: Tentative Agenda and Background Materials

To prepare you for your initial meeting to be held at 10 a.m. on Thursday, September 30 in Room 116 of the State Capitol Building, I have enclosed the following:

- A tentative agenda.
- The membership list and the proposed committee rules.
- A School Technology Background Information Memo.
- *National Trends: Enhancing Education Through Technology – No Child Left Behind Title II D Year One in Review,* February 2004, Conducted by the Metiri Group for the State Educational Technology Directors Association.
- *A Meta-Analysis of the Effectiveness of Teaching and Learning with Technology on Student Outcomes,* Learning Point Associates/North Central Regional Educational Laboratory, December 2003.
- An eSchool NEWSonline article, *Studies Validate Laptop Programs in U.S., Canada,* March 1, 2004.
- An eSchool NEWSonline article, *Test Scores Fuel Laptop Debate,* August 19, 2004.
- A NYTimes article, *The Tablet PC Takes Its Place in the Classroom,* September 9, 2004.
- A NYTimes article, *When Gadgets Get in the Way,* August 19, 2004.

- A District Administration: The Magazine for K-12 Education Administrators article, *A Tale of Two Laptops,* March 2004.

- A Bradenton Herald article*, Panel Wants Laptops for Every Student,* April 13, 2004. (The 102-page final report of the Laptops for Learning Task Force may be found at the following web site: http://etc.usf.edu/L4L/Index.html)

Please contact me if you have any concerns or suggestions.

I am looking forward to seeing everyone at the meeting.

IOWA LEARNING TECHNOLOGY STUDY COMMITTEE

MEMBERSHIP

Senator Jeff Angelo	*Representative Carmine Boal*
Temporary Co-Chairperson	*Temporary Co-Chairperson*
Senator Daryl Beall	*Representative Swati Dandekar*
Senator Robert Dvorsky	*Representative Ervin Dennis*
Senator John Putney	*Representative Rod Roberts*
Senator Ron Wieck	*Representative Cindy Winckler*

Tentative Agenda

Thursday, September 30, 2004
Room 116, State Capitol Building

10:00 a.m.	Call to Order Roll Call Opening Remarks Adoption of Rules Election of Chairpersons
10:15 a.m.	Mount Ayr Community School District
10:40 a.m.	Carroll Community School District
11:00 a.m.	Apple and Maine representatives
11:45 a.m.	Teleconference with Dr. Bruce Montgomery, Vice-President, Michigan Virtual University
12:00 Noon	Lunch
1:00 p.m.	Microsoft Representatives
1:45 p.m.	Gateway Representatives
2:30 p.m.	Discussion -- Determination of next meeting dates
	Adjournment

IOWA LEARNING TECHNOLOGY COMMITTEE

CHARGE: Develop a learning technology plan, including proposed policies and budgets for plan components; address professional development, implementation strategies and other phase-in issues, strategies for coordinating with existing technology initiatives and resources, and procedures for data tracking and assessment; and incorporate guiding principles outlined in 2004 Iowa Acts, SF 2298, section 244.

MEETINGS: 3

MEMBERS: 5 Senate, 5 House

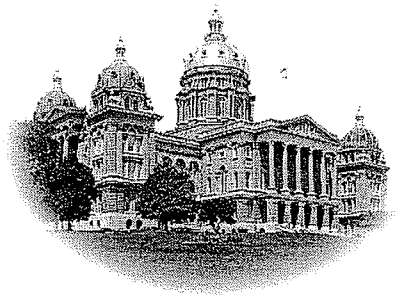
PROPOSED RULES

Iowa Learning Technology Committee

1. Six of the voting members shall constitute a quorum, but a lesser number of members may adjourn or recess the Committee in the absence of a quorum.
2. A majority vote of those voting members present is necessary to carry any action; however, no recommendations to the Legislative Council or General Assembly may be adopted without the affirmative votes of at least three members of each house.
3. Whenever Mason's Manual of Legislative Procedure does not conflict with the rules specifically adopted by the Committee, Mason's Manual of Legislative Procedure shall govern the deliberations of the Committee.
4. Meetings shall be set by motion before adjournment or by call of the Co-Chairpersons of the Committee if meetings are necessary before the date set in the motion.
5. Rules shall be adopted by the affirmative votes of at least three members of each house and may only be changed or suspended by a similar vote of the Committee.

Submitted:

September 30, 2004



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September 13, 2004

TO: MEMBERS OF THE IOWA LEARNING TECHNOLOGY COMMITTEE

FROM: KATHLEEN HANLON, SENIOR RESEARCH ANALYST

RE: SCHOOL TECHNOLOGY BACKGROUND INFORMATION

I. BACKGROUND OF THE IOWA LEARNING TECHNOLOGY COMMITTEE

2004 Iowa Acts, Chapter 1175, sections 242 – 246 (S.F. 2298), included language creating an Iowa Learning Technology Initiative. However, the Governor item vetoed significant portions of the initiative, including the creation of an 18-member Iowa Learning Technology Commission and an Iowa Learning Technology Fund, to establish a four-year learning technology pilot program and public-private partnership to provide a wireless laptop computer to each student, teacher, and relevant administrator in a participating school and implement the use of software, on-line courses, and other appropriate learning technologies that have been shown to improve academic achievement and specified progress measures. The Governor's item veto message designated section 242, subsections 2 through 4, and sections 243 through 246 of the Act in their entirety as being disapproved. However, the enrolled copy of the Act, which is marked up by the Governor and returned to the General Assembly, was not marked to indicate disapproval of sections 243 through 246.

On June 29, 2004, the Legislative Council authorized the creation of the Iowa Learning Technology Committee and charged the Committee with developing a learning technology plan, including proposed policies and budgets for plan components; addressing professional development, implementation strategies and other phase-in issues, strategies for coordinating with existing technology initiatives and resources, and procedures for data tracking and

assessment; and incorporating guiding principles outlined in 2004 Iowa Acts, S.F. 2298, section 244. The Council authorized three meeting dates for the Committee.

II. STATE SCHOOL TECHNOLOGY STUDIES AND FUNDING: A SHORT HISTORY — 1971-2003

The history of educational technology in Iowa extends at least as far back as 1971, when the General Assembly stated its intent that "an educational radio and television facility, including provision for closed circuit television, be established to serve the entire state..."[1] Technological advances in the late 1980s and early 1990s brought numerous technological advances to Iowa government and business and industry. As these advances spread and economies of scale were realized, making technology more affordable, Iowa's political leaders were quick to realize the possibilities of providing Iowa's students with more varied coursework through the implementation of a statewide fiber-optic network to connect Iowa's K-12 schools, community colleges, and universities.[2] The quick growth of personal computers and their use as a tool to increase student achievement was studied by a legislative committee, the Iowa K-12 Education Reform Study Committee, as early as 1993. The state also provided moneys to school districts and area education agencies (AEAs) under the School Improvement Technology Program (renamed the School Improvement Technology Block Grant Program in 1999) from 1996 through 2003, for instructional technology expenditures specified in the Iowa Code during the years the program was in effect.

A. BLUEPRINT FOR SCHOOL TRANSFORMATION — 1993.

Iowa K-12 Education Reform Study Committee Final Report. Issued in January of 1993, the Blueprint for School Transformation was the result of two years of study by the Iowa K-12 Education Reform Study Committee. The 23-member committee included 16 legislative members and seven members of the general public. As the name of the report implies, the comprehensive report was an "intentionally broad-based framework designed to move education in Iowa forward into the 21st century." Among the Committee's many recommendations was the Iowa Computer Initiative, which called for the state to "initiate the coordination of a design of a computer for use by Iowa's students, their parents, and other learners" that "would be portable, durable, and upgradeable."[3]

To conduct its work more efficiently, the Committee divided itself into four subcommittees. One of the subcommittees, the Human and Technology Resources Subcommittee, included among its recommendations "[i]ncreasing student, teacher, and administrator access to state-of-the-art hardware, software, and courseware necessary for the full utilization of information technology," and "[e]stablishing networks and dissemination centers to study the theory and practice of school reform..." and to organize "research, development, and diffusion networks to provide state-of-the-art knowledge and technical assistance in utilization of instructional technology."[4]

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[1] 1971 Iowa Code § 8A.1.
[2] http://www.icn.state.ia.us/about/story/blossom.htm
[3] Iowa K-12 Education Reform Study Committee Final Report: Blueprint for Transformation, January 1993, p. 12. (see Appendix A)
[4] Ibid., pp. 19 and 27. (see Appendix B)

The Student Learning and Development Subcommittee's vision statement provided that "Iowa schools will be staffed by educators, paraprofessionals, teachers, and administrators fully prepared to engage in continual school transformation. Institutions of higher education, AEAs, and K-12 districts will operate as parts of an integrated system to provide the highest quality professionals for Iowa's schools. Technology will be an integral part of instruction and administration in Iowa schools. The capacity of students, teachers, and administrators to utilize technology will represent a major hallmark of Iowa's educational systems."[5] The subcommittee recommended "[e]stablishing teacher/student ratios appropriate to subject and grade levels, weighted for special student populations and flexible enough to accommodate new forms of instruction resulting from the introduction of educational technology."[6]

Senator Richard Varn presented the computer initiative to the Committee, noting that certain funds currently being spent in school districts could be saved by using computers. He suggested that vendors, computer industry companies, and phone and cable companies, among other private sector companies, would benefit if a computer were in each Iowa student's home, even though each vendor would be expected to help pay for the system. Computers could be bought in bulk for more savings, he indicated. The plan, he suggested, would benefit Iowa's students and would boost Iowa's economy.[7] The General Assembly appropriated $250,000 from the Lottery Fund for FY 1993-1994 to the Department of Education to be used for the Iowa Computer Initiative and to establish the Educational Technology Consortium.[8] However, the General Assembly appropriated these funds for FY 1995-1996 for purposes of the Career Pathways Program.[9]

A 50-state survey, conducted in 1992 at the Committee's request, highlighted some of the technology efforts being made by other states. Most involved equipping schools with computers and other advanced technologies and statewide management information systems.[10] (Appendix D)

The full report is on file with the Legislative Services Agency, or may be found at http://www4.legis.state.ia.us/scripts/lsa/docmgr/docmgr_comdocs.dll/showtypeinterim?idt=true&type=ih&fy=2005&com=60.

B. STATE FUNDING FOR INSTRUCTIONAL TECHNOLOGY – 1996 and 1999.

In 1996, the enactment of S.F. 2063 (1996 Iowa Acts, Chapter 1086) created the School Improvement Technology Program for the allocation of funds to elementary and secondary education entities for the acquisition of instructional technology. The Act appropriated $15 million to the Department of Education from the Rebuild Iowa Infrastructure Account and $15 million from the State General Fund for FY 1997, and created a standing limited appropriation of $30 million from the State General Fund for each of the next four fiscal years, FY 1998 through FY 2001. The Act directed the

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[5] Ibid., p. 25.
[6] Ibid., pp. 22 and 28. (see Appendix C)
[7] Ibid., p. 49.
[8] 1993 Iowa Acts ch. 180, § 64.
[9] 1995 Iowa Acts ch. 218, § 11.
[10] Iowa K-12 Education Reform Study Committee Final Report at 62-63.)

department to allocate funds to school districts, which under the Act included the Iowa Braille and Sight Saving School, the State School for the Deaf, the Price Laboratory School at the University of Northern Iowa, the State Training School, the Iowa Juvenile Home, Woodward State Hospital-School, and Glenwood State Hospital-School, based upon the proportion that the basic enrollment of a district bears to the sum of the basic enrollments of all school districts in the state. The Act allocated $450,000 to the AEAs. All elementary and secondary educational institutions were required to adopt technology plans supporting school improvement technology efforts and improve student achievement. The plans were required to include an evaluation component. Each AEA plan had to explain the assistance and support it would provide to the districts. Funds received by school districts could be used for the acquisition, lease, lease-purchase, installation, and maintenance of instructional technology equipment, and for staff development and training related to instructional technology. Funds allocated to AEAs were used to pay costs related to supporting school districts with technology planning and equipment and for staff development and training related to instructional technology. The Act prohibited the use of funds for collective bargaining or to increase staffing. The chapter creating the School Improvement Technology Program was repealed effective July 1, 2001.

In 1999, the General Assembly enacted H.F. 743 (1999 Iowa Acts, Chapter 18), which essentially continued, but renamed, the program as the School Improvement Technology Block Grant Program, providing a statutory limited appropriation for the program through FY 2003, for instructional technology expenditures specified in the Iowa Code during the years the program was in effect. House File 755 (2001 Iowa Acts, Chapter 176) reduced the statutory appropriation by two-thirds, to $10 million for FY 2002. Senate File 2326 (2002 Iowa Acts, Chapter 1171) repealed the program and its FY 2003 funding in 2002. House File 2613 (2002 Iowa Acts, Chapter 1173) appropriated $5.7 million for FY 2003 for purposes of the repealed program from the Rebuild Iowa Infrastructure Program. However, the moneys appropriated from the Rebuild Iowa Infrastructure Program were reduced to zero with the enactment of H.F. 2627 (2002 Iowa Acts, Second Extraordinary Session, Chapter 1003, §§ 200, 213).

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THE IOWA COMPUTER INITIATIVE

The Full Committee recommended that the state initiate the coordination of a design of a computer for use by Iowa's students, their parents, and other learners. It is intended that the computer would be portable, durable, and upgradeable. Each home would have a base unit connected to telecommunications systems, similar to the French Mini-tel machine. All qualified vendors would form a consortium, participate in the design, and have the opportunity to manufacture and sell the computers. The design would be such that the broadest possible range of current and future software will be compatible with the machine. If current collaborative efforts by computer industry companies and the federal government to establish standards and methods to meet the goal outlined above are achieved, the design time could be shortened. It would still be necessary to develop or decide upon the other aspects of the machine so as to meet the needs of the students, teachers, schools, and parents.

According to the proposal presented by Senator Varn and accepted by the Committee, the state would negotiate a price for the system based on a minimum of 500,000 units with warranties, maintenance agreements, upgrade options, and insurance. The state would find ways to base assembly, manufacturing, and support operations in Iowa to maximize the economic development benefit of the purchase. The state would also identify private sector partners who will help pay for the system. This could take the form of voluntary contributions, reductions in price, taxes and user charges on noneducational uses (e.g., home shopping, movies on demand, video phone calls, surcharges on software for personal use, etc.). Contributions and other revenue would be used to reduce the price the student will need to pay. Possible private sector partners would include phone and cable companies, hardware and software manufacturers, information and entertainment companies, and printers and publishers.

All students would have access to a computer and may purchase one under this plan. Sliding fee scales for using and purchasing computers, similar to book fees, should be used and costs should be spread out over a period of years. The cost to the student able to pay should not exceed $400. For example, this could be assessed at $80 per year for the five-year useful life of the computer. The remainder of the cost will come from the private sector partners. If students and their families pay the fee, they would own the portable computer and home docking station.

The purchase date should be at least three years distant, sometime between 1996 or 1997, to allow time for design, fundraising, and training for administrators, teachers, students, and their parents. Schools should receive prototypes to allow educators and students to build expertise in using the system and to suggest design modifications.

Appendix A
Iowa K-12 Education Reform Study Committee Final Report: Blueprint for Transformation
January 1993
pp. 12 - 13

Iowa educators, business interests, and academics would be teamed to develop new software for sale to Iowa students and schools at or below cost. It would also be for sale to others at a profit to compensate the developers and to provide additional income to subsidize the computer purchase and the upgrade and maintenance costs. Software sales and support activity would be based in Iowa. First products could be programs that combine the power of virtual reality systems with sound pedagogy to produce learning experiences that can compete with video games for students' time and energy. (Note: Virtual reality combines computer-controlled images with a video visor or helmet and sensors that detect the wearer's movements to create the very real illusion of being inside the computer-controlled picture.)

Beyond the educational opportunities, the program would provide a fixed base of over a million potential customers for new and existing information companies to begin or expand businesses in Iowa. This program, then, can help transform both schools and the Iowa economy. The potential synergy between information companies and thousands of computer-literate students and adults could turn Iowa back into a growing state with quality job opportunities.

PART III

SCHOOL STRUCTURES, AUTHORITY, AND ACCOUNTABILITY
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
1. Sharing school governance with teachers and parents. a. Addressing the issues of authority and accountability within a broader range of state regulations. Whenever possible, decision making should be made at the local level. b. Sharing the responsibility for systemic accountability with administrators, teachers, parents, students, state and local boards of education, and local stakeholders. c. Encouraging administrators, teachers, parents, students, and local stakeholders to govern their individual school buildings. d. Providing administrators and teachers with ample time to make educational decisions and to participate in site-based management activities. e. Providing administrators and teachers with appropriate education to make educational decisions and to participate in site-based management activities.	Adopt Department of Education 1993 recommendations to support creative approaches in how students learn at higher levels. Adopt legislation to modify school accreditation process to allow for a results-based accreditation alternative. Expand intervention strategies for assisting school districts that fail to meet accreditation standards.	Legislature Department of Education Local School Districts Legislature to modify accreditation process Legislature to modify accreditation process	To begin 1993-95	Legislature Department of Education Local School Districts Legislature Legislature
2. Providing parents, students, and stakeholders with regular evaluative reports.	Continue current requirements in Sections 280.12 and 280.18	Department of Education Local School Districts	To begin 1993-95	Local school districts report to Department of Education
3. Encouraging collaboration between public schools and the private sector.	Continue current requirements in Sections 280.12 and 280.18	Department of Education Local School Districts	To begin 1993-95	Local school districts report to Department of Education
4. Redesigning instructional time to include a wider variety of teaching strategies.	Continue current requirements in Sections 280.12 and 280.18	Department of Education Local School Districts	To begin 1993-95	Local school districts report to Department of Education

SCHOOL STRUCTURES, AUTHORITY, AND ACCOUNTABILITY
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
5. Removing intrusions on instructional time.	Continue current requirements in Sections 280.12 and 280.18	Department of Education Local School Districts	To begin 1993-95	Local school districts report to Department of Education
6. Examining the student calendar in terms of the total number of hours in a school day and year and assessing the values of summer, weekends, and after-school attendance.	Continue current requirements in Sections 280.12 and 280.18	Department of Education Local School Districts	To begin 1993-95	Local school districts report to Department of Education
7. Maximizing educational resources through the development of appropriate school transformation plans which reflect both short-term operational and long-range strategic goals and objectives.	Adopt legislation to combine current planning, assessing, and reporting requirements into a comprehensive school transformation plan. Establish a joint legislative education committee to oversee the visions, goals, and objectives of the School Transformation Report.	Legislature Local School Districts Legislature	1993-95 Ongoing	Department of Education Legislature

HUMAN AND TECHNOLOGICAL RESOURCES
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
1. Assuring that policies adopted in pursuit of this and other goals maintain equitable access to educational opportunities. a. Affirming the state's responsibility to provide all residents with equal opportunities to a quality education. b. Recruiting and retaining a culturally diverse workforce that is reflective of its society. c. Promoting programs which emphasize appreciation for cultural diversity and guarantee equal opportunity and access. d. Examining the logistical problems and equity issues arising from interdistrict open enrollment. e. Providing professional development for education professionals to increase knowledge and awareness for the implementation of curricula that reflect cultural diversity. f. Coordinating programs between secondary schools and Iowa colleges to ensure that people of color and other underrepresented populations have greater access to higher education programs and services.	Develop and support programs to attract and retain a culturally diverse workforce.	Legislature Department of Education Colleges and Universities AEAs Local School Districts	To begin 1993-95	Legislature Department of Education Colleges and Universities AEAs Local School Districts
2. Providing adequate time and training for teachers and administrators and encouraging innovative usage of time to develop new skills in the following areas: a. Individualized and small group instruction. b. Technology operations and applications. c. Site-based management and educational decision making. d. Educational research, field testing, and grant writing. e. Use of databases, management softwear, and courseware. f. Team building, problem solving, and data gathering.	Lengthen teacher contract two days per year for the next five years. Restore Phase III funding and allow for competitive grants.	Legislature Local School Districts Legislature	To begin 1993-95	Local school districts report to the Department of Education Department of Education
3. Developing a statewide staff development program for educators, prekindergarten through higher education, focusing on the knowledge, skills, and attitudes needed to continually transform schools.	Adopt legislation to encourage local districts to set aside a percentage of school budget for staff development.	Legislature AEAs Local School Districts	To begin 1993-95	Local school districts report to Department of Education

HUMAN AND TECHNOLOGICAL RESOURCES
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
4. Finding ways to increase noninstructional time to plan and prepare for activities related to school transformation. a. Extending teacher contract days for training and planning outside of instructional time. b. Developing teacher mentor programs and reducing teachers' first-year workloads.	Local initiatives	Department of Education AEAs Local School Districts	To begin 1993-95	Department of Education Local School Districts
5. Offering more competitive salaries and benefits to Iowa educators.	Provide resources so that education salaries are adequate to attract and retain quality people. Study three-level licensure system.	Legislature Department of Education Board of Educational Examiners	To begin 1993-95	Progress report to the Joint Legislative Education Committee
6. Increasing the number of trained adults in the classroom to release teachers from clerical tasks and provide instructional support.	Local initiatives	Department of Education Local School Districts	To begin 1993-95	Department of Education Local School Districts
7. Encouraging community colleges, colleges, and universities to form partnerships with school districts for the initial and ongoing education of teachers and administrators.	Base teacher preparation program approval on critical proficiencies. Fund innovative clinical preparation programs.	State Board of Education Colleges and Universities AEAs Local School Districts	To begin 1993-95	Teacher preparation institutions report to Joint Legislative Education Committee

HUMAN AND TECHNOLOGICAL RESOURCES
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
8. Increasing student, teacher, and administrator access to state-of-the-art hardware, software, and courseware necessary for the full utilization of information technology. a. Providing time and compensation for appropriate school personnel to achieve competence in the use of instructional technology. b. Supporting the Department's effort to conduct a statewide inventory and making recommendations for the efficient uses of technology in Iowa schools, pre-K to postsecondary. c. Developing a standardized computer program to unify the reporting process to the Department of Education. d. Providing each school with the information infrastructure necessary to support full use of information technology. e. Providing each school with adequate facilities and climate control equipment for year-round use.	Adopt local policy and legislation to support computer technology initiatives. Provide resources and staff development to increase the capacity of local schools to utilize technology.	Legislature Department of Education Colleges and Universities AEAs Local School Districts	To begin 1993-95	Legislature Department of Education Colleges and Universities AEAs Local School Districts
9. Legislating funding to support educational transformation activities in Iowa schools.	Restore Phase III funding with a portion devoted to competitive grants. Provide adequate, equitable and predictable funding for school districts. Adopt legislation requiring simple majority for bond issues.	Legislature Legislature Legislature	To begin 1993-95	Department of Education Legislature Department of Education
10. Identifying options for pooling resources and reducing duplication of services and programs.	Local initiatives	Department of Education AEAs Local School Districts	To begin 1993-95	Department of Education AEAs Local School Districts

HUMAN AND TECHNOLOGICAL RESOURCES
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
11. Using Phase III moneys for pilot projects and school transformation activities.	Restore funding for Phase III with a portion devoted to competitive grants for school transformation.	Legislature Department of Education AEAs	To begin 1993-95	Legislature Department of Education AEAs
12. Seeking additional funding through direct solicitation of public and private grants.	Local initiatives	Department of Education AEAs Local School Districts	To begin 1993-95	Department of Education AEAs Local School Districts
13. Establishing networks and dissemination centers to study the theory and practice of school reform. a. Utilizing practice-based research, cooperative learning, and team planning/teaching. b. Organizing research, development, and diffusion networks to provide state-of-the-art knowledge and technical assistance in the utilization of instructional technology.	Local initiatives	Department of Education Colleges and Universities AEAs Local School Districts	Long-range	Department of Education Colleges and Universities AEAs Local School Districts
14. Providing a continuum of learning opportunities for Iowa teachers.	Local initiatives	Legislature Department of Education Colleges and Universities AEAs Local School Districts	Long-range	Legislature Department of Education Colleges and Universities AEAs Local School Districts

STUDENT LEARNING AND DEVELOPMENT
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
1. Providing access to developmentally appropriate early childhood and prekindergarten programs. Advocating and making provisions for upgraded elementary settings that permit students to advance in their educational attainments when they are ready to do so.	Fund early childhood at-risk grant program and incrementally increase funding in order to provide services to all 4-year-old at-risk students who are not being served through federal funds.	Legislature	To begin 1993-95	Department of Education
2. Allowing for professional discretion in defining and achieving educational outcomes within a broader range of district and state regulations.	Adopt broad state student outcomes. Amend Section 280.18 so that local student achievement goals reflect state outcomes.	State Board of Education Legislature	To begin 1993-95	Local school districts report on compliance
3. Developing a plan to encourage greater involvement of parents in the teaching and learning process.	Transformation plan. Funding for Parent Education Programs. (S.F. 2167)	Legislature Local School Districts	To begin 1993-95	Department of Education
4. Collaborating with parents and various service agencies to provide a unified, streamlined continuum of services to students and their families. a. Assisting children and their families in obtaining the proper array of services in collaboration with trained professionals who are able to identify the educational and developmental needs of children. b. Organizing a unified systemic approach to protecting the well-being of children, eliminating competing or duplicative services, and promoting the possibilities of governmental entities working together to develop new and better ways to meet the educational, physical, and emotional needs of children.	Adopt legislation to encourage community service projects utilizing work study, course credit, voc ed competencies, and campus compacts. Fund family resource centers.	Legislature Legislature	To begin 1993-95	Colleges and Universities Legislature

STUDENT LEARNING AND DEVELOPMENT
ACTION PLANNING MATRIX

OBJECTIVE	ACTION NECESSARY	WHO IS RESPONSIBLE	TIME FRAME	ACCOUNTABILITY
5. Establishing teacher/student ratios appropriate to subject and grade levels, weighted for special student populations and flexible enough to accommodate new forms of instruction resulting from the introduction of educational technology.	Local initiatives	Legislature Department of Education Local School Districts	Long-range	Legislature Local school districts report to Department of Education
6. Developing a strong general curriculum framework based on high academic expectations and attainable outcomes.	Design curriculum frameworks to assist local districts.	Department of Education	Long-range	Submit copies to Legislature and local school districts
7. Giving teachers the time and training to evaluate students in an equitable, timely, and professional manner.	Appropriate resources to assist local school districts in developing their capacity to measure student achievement using multiple assessments.	Legislature/Center for the Assessment of School Effectiveness	Long-range	Progress report to the Joint Legislative Education Committee
8. Continuously assessing and reporting the progress of students utilizing personalized educational plans and electronic recordkeeping systems.	Local initiatives	Department of Education Local School Districts	Long-range	Department of Education Local School Districts
9. Utilizing multiple uniform measurement systems and instruments that provide accurate, objective, and timely information, recognizing the differences between the assessment of student achievement and school system performance.	Support the Center for Assessment for School Effectiveness.	Department of Education	Long-range	Progress report to Joint Legislative Education Committee
10. Requiring schools and community colleges to assess and document their instructional, administrative, and operational effectiveness.	Local initiatives	Department of Education Local School Districts		Local school districts report to Department of Education

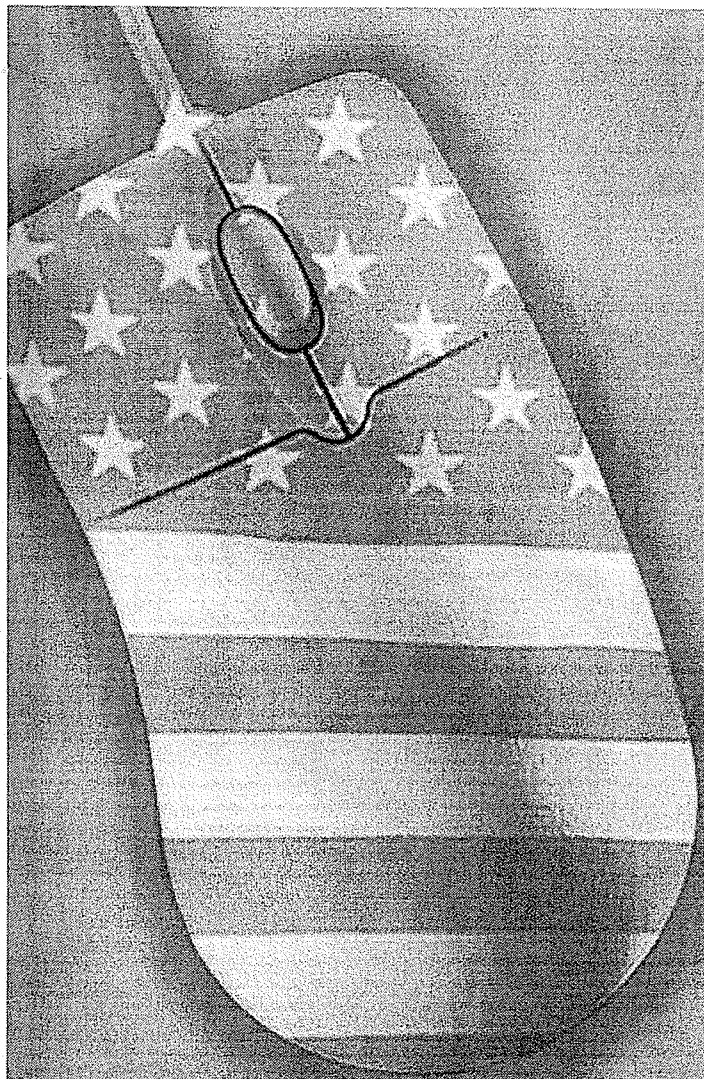
TECHNOLOGY

Representative of 42 percent of the states surveyed, 21 states are actively involved in technological planning and programming. Alaska, Indiana, North Carolina, Hawaii, and Pennsylvania appropriated special funds to increase the use of technology in their schools. The Alaska 2000 Program (AK2K) focuses upon technology and human resources. With state funding, Indiana initiated two projects -- the Buddy System, which is a take-home computer project for students in grades 4-6, and the Computer/Teacher Project, which allocates to each teacher $3,000 for hardware and $500 for software. Hawaii appropriated moneys for supplemental education spending to maintain current services, cover cost of school supplies, and pay for computers placed in elementary schools. (4) Similarly, North Carolina has taken extensive measures to equip elementary schools with computers and other advanced technologies. Capitalizing on mass purchasing agreements, Pennsylvania purchased computers for districts that could not afford the purchases. In 1989, Ohio passed Senate Bill 140, which was a major education reform bill that included the establishment of an education database to more effectively measure student achievement. This bill also mandated the creation of a statewide management information system.

Similarly, Iowa, Utah, and West Virginia approved millions of dollars to advance the technology initiatives within their states. Thirty million dollars over a six-year period has been allocated to install the Iowa Communications Fiber Optic Network. In addition, the Iowa Department of Education has established a technology commission to develop strategies for employing distance learning, as well as other high-tech concepts. Utah established a Technology Initiative Project Office for the purposes of restructuring the teaching/learning process, as well as its delivery. Beginning Fiscal Year 1993, West Virginia created an applied technology fund to award competitive grants to institutions of higher learning. In addition, the legislature appropriated $750,000 for computer laboratories for use by students enrolled in teacher education programs. Two million dollars was allocated for the installation of the West Virginia Network, WVNET, which is an academic administrative network. Funded from both general tax and lottery revenues, West Virginia later approved $7,020,000 to place computers in all elementary classrooms by 1999. (23)

Twenty-eight schools in North Dakota participated in the MCREL distance learning project which involved the students in a variety of technological advances, i.e., analog, digital interactive television, audiographic telelearning, and instruction by satellite. Courses such as art, Japanese, Russian, accounting, anatomy/physiology, child development, probability, statistics, and microeconomics were sent across the state. (29) Although there remain many unanswered questions, the pilot project was a success and favorably received by the majority of students. In Idaho, the State Department of Education and the Public Broadcasting System are exploring distance learning options. The Idaho

Legislature also is considering the installation of a fiber optic backbone within the State Capitol Complex. Through the sponsorship of competitive grant awards, both Pennsylvania and Wyoming have appropriated funds to promote innovative uses of technology in their schools. By 1993 the state of Nebraska will begin the development of a statewide technology infrastructure which will allow affordable access for schools and teachers to more information and greater distance learning opportunities.



SETDA

National Trends:
Enhancing Education Through Technology

No Child Left Behind Title II D - Year One in Review

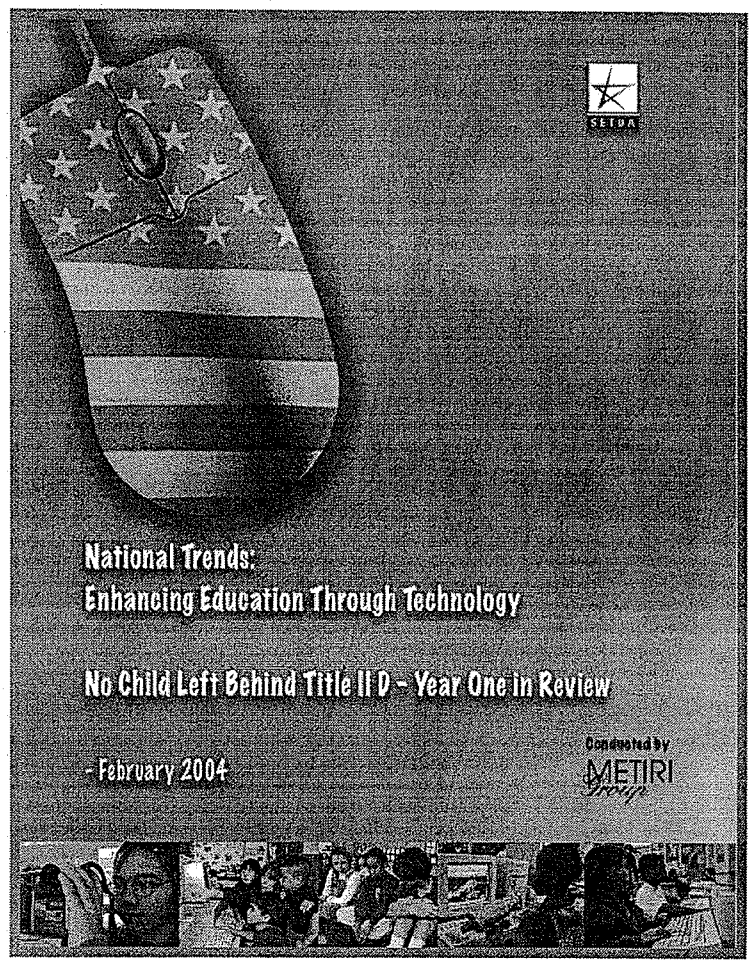
- February 2004

Conducted by
METIRI Group

The State Educational Technology Directors Association (SETDA) was established in the fall of 2001 and is the principal association representing the state directors for educational technology. www.setda.org

Metiri Group is a national consulting firm located in Los Angeles, California, that specializes in systems thinking about educational technology. www.metiri.com

Copies of the report on the survey findings can be accessed in PDF format at www.setda.org.



Commissioned by: SETDA

State Educational Technology Directors Association

Produced by: METIRI *Group*

Cheryl Lemke, Kirk Vandersall, and Daran Ravden

Message to the Reader

The No Child Left Behind, Title II, Part D, Enhancing Education Through Technology (NCLB II D) program requires that states and schools focus their use of technology on improving academic achievement.

In the fall of 2003, SETDA commissioned the Metiri Group to work with the Common Data Elements Task Force and the Data Collection Committee to conduct a national survey to answer questions about the first year of implementation of this new program.

The findings from SETDA's national survey will provide states, local school districts, policymakers, and the U.S. Department of Education with insights into the following questions:

1. How are grant recipients across the nation structuring programs to meet NCLB II D goals?
2. What administrative approaches by states are most effective in guiding and supporting LEAs?
3. Is the program, with its current structure, likely to lead to the achievement of NCLB II D goals?

"Title II D provides funds and an emphasis on technology's potential to improve learning. In tight times, without those funds, we believe this critical emphasis would be lost."

—State Technology Director

SETDA expresses its sincere appreciation to the state technology directors who completed the survey.

The Common Data Elements Task Force:

Deborah Sutton (MO), Chair
Jerry Bates (TN), Vice Chair
Dean Bergman (NE)
Jerome Browning (AL)
Neah Lohr (WI)
John Merritt (WV)
Sherawn Merritt Reberry (ID)
Brenda Williams (WV)
Mary Ann Wolf (SETDA)

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"The emphasis on professional development will be a key component of this program in changing teachers' beliefs and practice in classroom teaching through the use of technology."

—Teh-Yuan Wan, NCLB Title II D State Coordinator, New York State Department of Education

Executive Summary

In the fall of 2003, the State Educational Technology Directors Association (SETDA) commissioned the Metiri Group to conduct a national survey on the first year of implementation of the No Child Left Behind, Title II, Part D, Enhancing Education through Technology program. The findings in this report represent 46 states and the District of Columbia, representing 92% of the federal dollars allocated across the United States in 2002-2003.

The critical role of NCLB, Title II, Part D funding in advancing the effective use of technology in student learning is striking, as evidenced by the state technology directors' comments below. For 25% of respondents, these funds were literally the "only game in town"; their school districts had no other funding earmarked specifically for technology in schools.

> *"Title II D provides funds and an emphasis on technology's potential to improve learning. In tight times, without those funds, we believe this critical emphasis would be lost."*
>
> *"Formal evaluation studies are currently underway, but data from the technology integration specialists in terms of weekly reports and meetings show very positive results in terms of the classroom teachers integrating technology into their curriculum."*
>
> *"The federal NCLB funding is critical to the continuation of educational technology programs among all school districts in our state."*
>
> *"Title II D provides a significant supplement to other federal, state, and local educational technology funding initiatives. Grantees are asked to leverage other funding sources to enhance educational technology and the integration of technology into the curriculum."*

The findings from SETDA's national survey are intended to inform education technology policy leaders on three important questions.

1. **How are grant recipients across the nation structuring programs to meet Title II D goals?**

    a. Survey respondents indicated that the competitive grant program has much greater potential for advancing Title II D program goals than the formula program does (excepting those LEAs receiving more substantial formula awards). In general, states identify the following criteria in structuring their competitive grants. They are:

        i. Sufficient in size to advance the goals (e.g., many are specifically targeted to content areas)
        ii. Grounded in sound education practice
        iii. Modeled after successful state programs
        iv. Based on ISTE national technology standards, state learning standards, and state educator (teacher and administrator) standards

    b. While many states are attempting to stretch state administrative and technical support funds to provide guidance and training in program evaluation, most find that such budgets are used up by the administrative requirements of implementing two relatively complex programs that often require parallel administrative procedures. Most survey respondents indicate that state leadership functions for the Title II D program are minimal and perfunctory due to a lack of funding, staffing, resources, and flexibility with program funds.

2. What administrative approaches by states are most effective in guiding and supporting LEAs?

a. The collaboration and cooperation between federal and state programs is on the rise. The shortage of monies dedicated to education technology makes such leveraging of funds critical to the achievement of program goals.

b. Many states are aligning their federal program dollars with current state initiatives through criteria in their competitive grant applications. With the states experiencing deep cuts in their educational technology programs, Title II D is often cited as the only means for sustaining and continuing a focus on effective use of technology for learning.

c. States and the District of Columbia are finding it challenging to administer formula grant funds given the large number of grant awardees. Respondents report different approaches to the two programs, with increased state support, technical assistance, training, and evaluation emphasis given to competitive grants.

3. Is the program, with its current structure, likely to lead to the achievement of Title II D goals?

"The emphasis on infusing technology into classroom instruction is starting to impact classroom practice."

"There is great potential to change classroom practices, especially with the 25% professional development requirement."

a. In general, survey respondents reported that the Title II D focus on using technology for the improvement of academic achievement is a positive policy lever, in many cases enabling LEAs to leverage multiple program monies and multiple partners on the same goals.

b. Due to the number of extremely small annual allocations of formula funds awarded to a large number of LEAs, survey respondents anticipated different results from the programs. The expectation is that the formula grants would be used to sustain and maintain current programs, while the competitive funds would be used to take education technology to the next level.

c. Without increased flexibility to strategically use additional Title II D funds at the state and regional levels, this will be a missed opportunity to document effectiveness (or lack thereof) in the use of technology-based learning resources. Survey respondents suggested that even though program evaluation is important, research studies are needed to report with confidence that, under the right conditions, specific uses of technology are effective in improving student learning. Building that national knowledge base of "What Works" will take leadership and strategic policy agendas at the state level, and that will require additional flexibility in the use of program funds to build both the capacity and the propensity of LEAs to engage in rigorous evaluation and research. Much could be gained in these critical areas through the development of federal and state guidelines and the facilitation of professional learning communities around these critical issues.

d. In addition to continuing their investigation of technology-based learning interventions, states are exploring the use of technology in areas such as data analysis to inform instructional decisions; curriculum management in support of professional learning communities; and advancing instruction grounded in emergent cognitive research.

An Overview: NCLB Title II, Part D

The No Child Left Behind (NCLB) legislation was passed by Congress in 2001, reauthorizing federal funding for elementary and secondary schools for 2002–2006. That legislation recast many of the previous programs for learning technology into a new program: NCLB Title II, Part D, Enhancing Education Through Technology (EETT).

In 2002 the U.S. Department of Education launched the program through awards to the 50 states and the District of Columbia totaling $595,028,537 (this total does not include allocations to U.S. territories; see table at the right for specific allocations).

As with all funds in NCLB Title II D funds are intended to improve student achievement—in this case, through the effective use of technology:

(1) Primary Goal

To improve student academic achievement through the use of technology in elementary and secondary schools

(2) Additional Goals

(A) To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability

(B) To encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by State educational agencies and local educational agencies

These goals focus Title II D funding on the improvement of student learning in Local Education Agencies (LEAs) that serve high-need students. The table at the right lists the first year allocation to each state and the District of Columbia. Each recipient is allowed to use up to 5% of the funds for administration and/or technical assistance. The remaining 95%, split equally between formula and competitive grants to eligible LEAs in the state program, are intended to improve student achievement through the effective use of technology.

Table 1: Educational Technology State Grants

FY 2002 Final State Allocations	
Alabama	$8,791,720
Alaska	$3,075,155
Arizona	$10,111,492
Arkansas	$5,517,256
California	$85,100,541
Colorado	$5,568,211
Connecticut	$6,156,880
Delaware	$3,075,155
District Of Columbia	$3,075,155
Florida	$28,305,148
Georgia	$18,583,322
Hawaii	$3,075,155
Idaho	$3,075,155
Illinois	$25,449,851
Indiana	$8,956,721
Iowa	$3,534,232
Kansas	$4,285,294
Kentucky	$8,796,493
Louisiana	$11,457,597
Maine	$3,075,155
Maryland	$9,144,228
Massachusetts	$12,790,389
Michigan	$24,289,995
Minnesota	$6,592,391
Mississippi	$6,103,825
Missouri	$9,309,664
Montana	$3,075,155
Nebraska	$3,075,155
Nevada	$3,075,155
New Hampshire	$3,075,155
New Jersey	$14,966,364
New Mexico	$4,849,382
New York	$60,891,561
North Carolina	$12,681,485
North Dakota	$3,075,155
Ohio	$19,223,306
Oklahoma	$7,088,976
Oregon	$5,493,386
Pennsylvania	$22,777,739
Rhode Island	$3,075,155
South Carolina	$8,390,813
South Dakota	$3,075,155
Tennessee	$8,283,623
Texas	$50,708,019
Utah	$3,075,155
Vermont	$3,075,155
Virginia	$10,361,636
Washington	$8,263,763
West Virginia	$4,504,746
Wisconsin	$8,496,008
Wyoming	$3,075,155
Total for 2002–2003	*** $595,028,537**

*Total does not include allocations to U.S. Territories.

NO CHILD LEFT BEHIND TITLE II, PART D
SEC. 2402. PURPOSES AND GOALS

(a) PURPOSES: The purposes of this part are the following:

(1) To provide assistance to States and localities for the implementation and support of a comprehensive system that effectively uses technology in elementary schools and secondary schools to improve student academic achievement.

(2) To encourage the establishment or expansion of initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local educational agencies.

(3) To assist States and localities in the acquisition, development, interconnection, implementation, improvement, and maintenance of an effective educational technology infrastructure in a manner that expands access to technology for students (particularly for disadvantaged students) and teachers.

(4) To promote initiatives that provide school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction that are aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.

(5) To enhance the ongoing professional development of teachers, principals, and administrators by providing constant access to training and updated research in teaching and learning through electronic means.

(6) To support the development and utilization of electronic networks and other innovative methods, such as distance learning, of delivering specialized or rigorous academic courses and curricula for students in areas that would not otherwise have access to such courses and curricula, particularly in geographically isolated regions.

(7) To support the rigorous evaluation of programs funded under this part, particularly regarding the impact of such programs on student academic achievement, and ensure that timely information on the results of such evaluations is widely accessible through electronic means.

(8) To support local efforts using technology to promote parent and family involvement in education and communication among students, parents, teachers, principals, and administrators.

(b) GOALS:

(1) PRIMARY GOAL: The primary goal of this part is to improve student academic achievement through the use of technology in elementary schools and secondary schools.

(2) ADDITIONAL GOALS: The additional goals of this part are the following:

(A) To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability.

(B) To encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by State educational agencies and local educational agencies.

Introduction to the Study

Tracking Progress with Learning Technology

In 2002, the State Educational Technology Directors Association (SETDA) set out to identify a set of common data elements for assessing progress in education technology throughout the nation. The intended use of the data was two-fold: to track state progress on NCLB (Title II D) and to provide a basis for state comparisons in national reports about learning technologies. Given the high stakes of the federal legislation, the emphasis to date has been on building an assessment for Title II D.

Title II D legislation calls for increased academic achievement through strategic, effective approaches to the use of technology in schools. Given this directive, it was clear that the data collection processes used by most states in the past—school and district surveys—would not be sufficient. The process must include data from teachers and students at the classroom level in addition to state, district, and school survey data that address policies, practices, and impact.

SETDA commissioned the Metiri Group to work with the Common Data Elements (CDE) Committee to develop both the framework and statistically reliable instruments for assessing national, state, and local progress in using technology to advance learning goals. A first draft of the framework was completed in January of 2003. The framework is based on a set of key questions to which indicators and data elements are aligned. A suite of statistically valid protocols and instruments is currently in the piloting phase and should be available to the states in the spring of 2004. Once completed (if states are in the position to fund the data collection), that suite of tools, correlated with student data, will enable states to understand trends in their use of technology to improve learning.

The state-level survey was originally intended to answer a set of policy questions in the framework, with a subset of questions informing specific questions about the implementation of Title II D. The severe economic challenges states have faced during the past few years have dramatically decreased state funding earmarked for school technology. Since many states' Title II D funds had become the only state-level funds targeted to school technology, the CDE Committee made the decision to focus the fall 2003 state survey exclusively on the implementation of Title II D.

Methodology

Consistent with other federal programs, it is the responsibility of each state to collect, analyze, and report to the U.S. Department of Education its progress in meeting NCLB, Title II, Part D goals. The state survey is intended to be one of a suite of assessment tools developed to collect data on implementation of the 2002–2003 Title II D program at the state level.

This report is based on an analysis of data collected through a state-level survey of state technology directors. The questions included in the state survey instrument were based on the policy sections of the CDE framework and on Title II D requirements. Following several iterations of review and revision by the CDE Committee, Metiri Group produced an online version of the survey. That online survey was subsequently field tested by members of the CDE Task Force. Once finalized, SETDA requested that the 50 states plus the District of Columbia complete the survey. Between November 21 and December 19, 2003, 46 state departments of education, plus the District of Columbia, completed the survey. Once the survey was closed, Metiri contacted 12 state directors for clarifications and/or completion of their data entry.

Metiri Group presented a preliminary report at the National Leadership Institute hosted by SETDA on December 6–10, 2003. SETDA is providing individual states with a comprehensive state profile based on the survey data. Should the states use the suite of tools SETDA will be offering in its resource toolkit scheduled for release in April of 2004, this information will become one source of data to inform a state's progress in meeting Title II D goals.

States Participating in the SETDA Survey:

Alabama
Alaska
Arizona
Arkansas
California
Delaware
District of Columbia
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming

The findings from this report are derived from survey data collected from a single respondent, usually the state technology director, in 46 states plus the District of Columbia. Collectively, those survey respondents represent $551,923,143 in Title II D funding annually, or 92% of the total funding for the 50 states and the District of Columbia ($595,028,537).

The number of LEAs represented by survey respondents is 15,040. Of that number, 12,361 (91%) are eligible for Title II D funds.

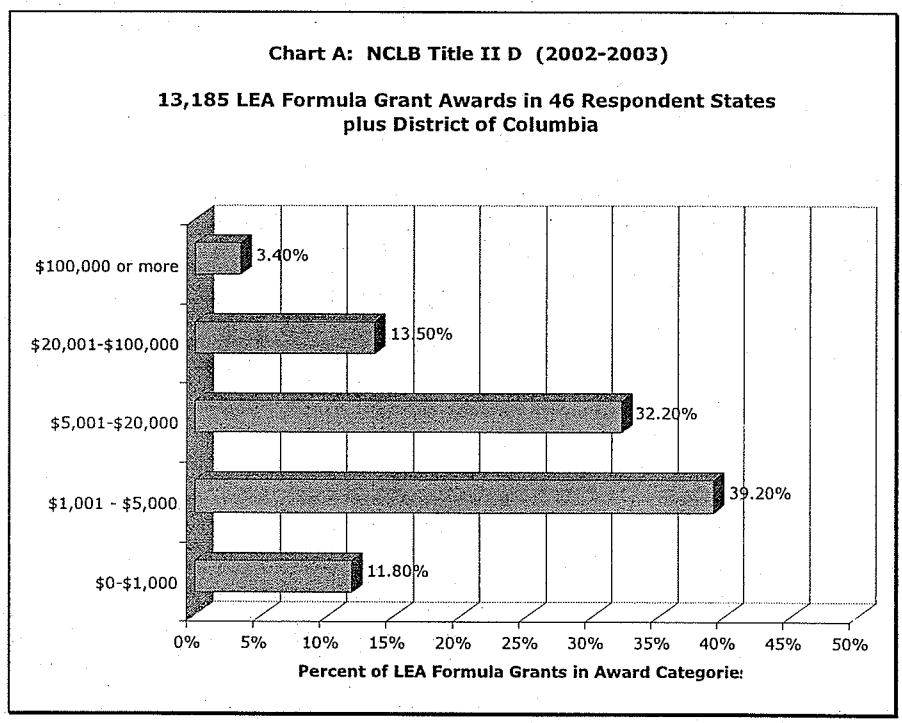
Formula Grants: Facts & Figures

According to Section 2412 of NCLB, Title II, Part D, each state education agency is required to allocate 50% of the non-administrative/non-technical assistance Title II D funding (at least 47.5% of the total) to formula grants. Survey respondents report the following facts as related to formula grants:

Over 90% of all Local Education Agencies (LEAs) in the United States are eligible to receive Title II D formula grants.

Of those eligible, over 6 percent either refused the award or did not apply, because, according to survey respondents, "the award was too small."

The formula grant awards to LEAs ranged from $278 to $6,672,114. Over 50% of the grants awarded were under $5,000.



Survey respondents report that because so many of the formula grants are small:

- The funds are used—for the most part—to maintain existing programs.

  Comment: *"Some of the school districts that received a small amount of formula grant funds are using the funding to procure technology supplies (e.g. printer cartridges, etc.), rather than for more thoughtful uses of the funding."*

- The impact will be difficult to assess.

  Comments: *"With so little funding spread in so many areas, it will be hard to prove effectiveness,"* and *"The program structure makes monitoring the formula funds difficult."*

The top five purposes for which formula grants were used were (in priority order):

- Professional Development—Professional development that provides school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.
- Increased Achievement and Technology Literacy—Adapt or expand existing and new applications of technology to enable teachers to increase student academic achievement, including technology literacy.
- Technology—Acquire, adapt, expand, implement, repair, and maintain existing and new applications of technology to support the school reform effort and to improve student academic achievement, including technology literacy.
- Increased Access—Establish or expand initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local educational agencies.
- Networking and Infrastructure—Acquire connectivity linkages, resources, and services (including hardware, software, and other electronically delivered learning materials) for use by teachers, students, academic counselors, and school library media personnel in the classroom, in academic and college counseling centers, or in school library media centers in order to improve student academic achievement.

[Source of definitions: NCLB Title II D legislation.]

Table 2: Formula Grants – Round 1

State	Number of LEAs	Number of LEAs Eligible for Title II D	Percent of LEAs Eligible for Title II D	Number of Formula Grants Awarded in Round 1
Alabama	128	128	100%	126
Alaska	53	*51	96%	51
Arizona	600	435	73%	335
Arkansas	308	308	100%	308
California	1,281	1,081	84%	681
Delaware	30	30	100%	23
District of Columbia	36	36	100%	36
Georgia	180	122	68%	75
Hawaii	1	1	100%	6
Idaho	115	115	100%	115
Illinois	892	750	84%	600
Indiana	310	300	97%	281
Iowa	371	371	100%	370
Kansas	303	303	100%	303
Kentucky	176	175	99%	175
Louisiana	**88	81	92%	66
Maine	229	220	96%	219
Maryland	24	24	100%	24
Massachusetts	373	369	99%	304
Michigan	802	802	100%	640
Minnesota	475	400	84%	297
Mississippi	152	*152	100%	146
Missouri	524	520	99%	520
Montana	452	452	100%	322
Nevada	17	17	100%	10
New Hampshire	176	168	95%	133
New Jersey	664	497	75%	495
New Mexico	89	89	100%	89
New York	724	*698	96%	685
North Carolina	217	176	81%	129
North Dakota	211	*196	93%	196
Ohio	885	716	81%	716
Oklahoma	541	541	100%	535
Oregon	198	*177	89%	174
Pennsylvania	664	*567	85%	567
Rhode Island	46	44	96%	43
South Carolina	85	85	100%	85
South Dakota	172	172	100%	170
Tennessee	135	135	100%	133
Texas	1,220	*1,195	98%	1,180
Utah	53	*52	98%	52
Vermont	60	60	100%	60
Virginia	132	132	100%	132
Washington	296	*240	81%	240
West Virginia	55	*55	100%	55
Wisconsin	449	416	93%	413
Wyoming	48	48	100%	46
Totals or Averages	**15,040**	**13,702**	**91%**	**12,361**

*Source: Analysis or calculation of survey data.
**Source: National Center for Educational Statistics (NCES).

Twenty-three states did not report any transfers to or from their formula grant programs. Among those states reporting transfers, the following totals apply:

Dollars Transferred In	Dollars Transferred Out	Net Gain/Loss From Transfers:
$4,257,733	$1,934,431	$2,323,303

These transferred amounts do not indicate how or why funds were transferred, nor do they reflect all NCLB funding used for Title II D activities. Many districts are using other programs, such as Title V, for Title II D activities. In one state, for example, some districts are using Title I funds for professional development activities that incorporate Title II D goals.

Competitive Grants: Facts and Figures

According to Section 2412 of Title II D, each state education agency is also required to allocate 50% of the non-administrative/non-technical assistance Title II D funding (at least 47.5% of the total) to competitive grants. Survey respondents report the following facts as related to competitive grants:

Survey respondents reported 1,670 competitive grant awards, a fraction (13%) of the number of formula grant awards. These can be categorized as follows:

- 376 consortia grants
- 1,294 LEA grants

Thirty-three of the 47 respondent states (70.2%) reported that they encouraged consortia grants. They did so by limiting awards to consortia only (4 states: 8.5%); awarding extra points to consortia in the scoring process (13 states: 27.7%); disseminating information to potential members of consortia prior to submission date (20 states: 42.6%); or facilitating informational meetings to which potential consortia members were invited prior to submission date (21 states: 44.7%)

While 92% of respondents reported submitting a consolidated application, less than 10% reported teaming up with other programs for joint or integrated programs.

Nearly half of all respondents (23 states: 48.9%) awarded one-year grants, with 13 states (27.7%) awarding 2-year grants, and 10 states awarding 3-year grants. (Note: data was not available from one respondent.)

Sixty-two percent (62%) of respondents required that LEAs or consortia target their competitive awards. Representative topics and examples from states are listed below:

Table 3: Competitive Grant Topics Targeted by States

Representative Topics	Example of State Priority in Competitive Grant Process	
Professional development aligned to the effective uses of technology in learning	TX	The competitive grant focused on preparing teachers and campuses for the adoption of online instructional materials in the Technology Applications curriculum for K–12. The grant program was called Technology Applications Readiness Grants for Empowering Texas (TARGET). The Technology Applications curriculum includes digital technology literacy as well as integration of the technology across the curriculum. For the first time in Texas history, there was a call for subscription-based instructional materials. The TARGET grant focused on preparing teachers and campuses for the adoption of online instructional materials in the Technology Applications curriculum for K-12. Professional development addressed the use of digital technology in the classroom and the awareness of the instructional materials that will be available as a part of the statewide adoption process (materials for all students in grades K-8 and students in Technology Applications high school courses).
Integration of technology into curriculum and instruction that results in changes in classroom practice and higher academic achievement	MO	Districts participate in the state's eMINTS Program, which provides over 200 hours of professional development and support over the two-year period and assists teachers in grades 3–5 with integrating multimedia technology (a prescribed set of hardware and software) into inquiry-based and problem-based teaching practices that 1) are centered around student needs; 2) involve more than one discipline or subject area; and 3) teach students to work in collaborative ways.
Innovative coaching model for professional development	WV	The focus on technology integration specialists in the school(s) will assist teachers with the effective integration of technology into the curriculum. The ultimate goal is increasing student achievement.

The use of **technology to increase student achievement**	IN	The focus here was on increasing student achievement in math, language arts, or science, as determined by test scores and the school's improvement plan focus. The goal was a tight, scalable, replicable process that could be adopted and/or expanded by other schools looking to increase student achievement in that content area.
The use of **technology to advance literacy**, especially in the elementary schools	NJ	Language Arts Literacy is a State of NJ initiative. This grant program was designed to increase students' skills in the area of language arts literacy.
Innovative uses of technology in **assessment**	RI	The application of assessment strategies using hand-held computer implementation of assessment tools (e.g., electronic Running Record) assists teachers in assessing the effectiveness of their teaching of reading and literacy.
Programs to advance **students' technology literacy**	KS	Exemplar programs, such as Missouri's eMints and the GenY Program, were replicated through Technology-Rich Classrooms and Student Technology Leadership Programs. The purpose was to infuse technology into an engaging and active environment that enables the learner to become a technologist, problem solver, researcher, and communicator.

Top five areas in which competitive grants were used (in priority order):

- Professional Development—Professional development that provides school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.
- Increased Achievement and Technology Literacy—Adapt or expand existing and new applications of technology to enable teachers to increase student academic achievement, including technology literacy.
- Develop Experts—Prepare one or more teachers in elementary and secondary schools as technology leaders with the means to serve as experts and train other teachers in the effective use of technology, providing bonus payments to these technology leaders.
- Proven Learning and Technology Solutions—Acquire proven and effective courses and curricula that include integrated technology and are designed to help students meet challenging State academic content and student academic achievement standards.
- Technology—Acquire, adapt, expand, implement, repair, and maintain existing and new applications of technology to support the school reform effort and to improve student academic achievement, including technology literacy.

[Note: Definitions from NCLB Title II D legislation.]

State education agencies are using national and state standards and frameworks to guide their grantees' implementation of programs under Title II D.

- 59.6% of respondents use state standards
- 57.4% of respondents use the ISTE NETS for Students
- 61.7% of respondents use the ISTE NETS for Teachers
- 40.4% of respondents use the ISTE NETS for Administrators
- 17.0% use SETDA resources
- 17.0% use the CEO Forum Star Chart

- 17.0% use the Seven Dimensions for Gauging Progress (Milken Foundation)
- 11.0% use their own state framework
- 7.0% use the enGauge 21st Century Skills

The top sources used by respondents for research and practices related to technology were the Regional Technology Education Consortia, followed by the Regional Education Centers.

Over half of all respondents (25 states: 53.23%) indicated that they would be redesigning their competitive process in Year 2 or Year 3. Examples of respondents' expectations for such redesigns include increased alignment with state programs, state technology plans, and district needs; improved scoring systems or rubrics; a more targeted focus to achieve depth of return; and increased sustainability through additional years of grant support.

Forty-two percent of participating states indicated they would not conduct a state-level evaluation of their Title II D program for Year 1.

The purposes of Title II D are being addressed by the LEA competitive grant awards. As this is the first year of a five-year grant program, the jury is still out as to the impact of these programs on achievement of the three Title II D goals. See the following pages for LEA or Consortia competitive projects aligned to the purposes of Title II D.

Table 4: Competitive Grants – Round 1

State	Release Date (Round 1)	*Consortia Grants	LEA Grants	Leverage with Other Funds	Strategies Used to Ensure Leveraging of EETT through Other Funds
Alabama	5-Dec-2002	N/A	63	Yes	Applicants were required to indicate how they coordinate with other resources.
Alaska	15-Jun-2003	N/A	7	Yes	
Arizona	1-Jul-2002	3	40	Yes	Applicants were required to show consolidation of state resources and alignment with funding for school improvement.
Arkansas	3-Aug-2003	5	6	No	
California	14-May-2003	57	60	Yes	Applicants were given a competitive advantage if they leveraged other funds to support the EETT Competitive program.
Delaware	12-Aug-2002	N/A	3	No	
District of Columbia	1-Jun-2003	0	7	No	
Georgia	15-Mar-2004	1	75	Yes	LEAs were required to describe coordination of funds in their applications.
Hawaii	1-Feb-2003	13	6	Yes	Applicants were encouraged to form partnerships and leverage other funding sources.
Idaho	3-Jan-2003	0	22	No	Not designed into the competitive process, but it is encouraged. The money [for EETT] is not enough to fund a whole project.
Illinois	28-Mar-2003	8	45	Yes	
Indiana	1-Jun-2003	0	19	Yes	Applicants were required to describe how their educational technology project coordinates Title II D funds with other grant funds (e.g., federal, state, and local).
Iowa	31-Jan-2003	13	13	Yes	Applicants report leverage through AEA resources, personnel, current infrastructure, and LEA resources.
Kansas	1-Mar-2003	12	15	Yes	Collaboration with KAN-ED State Network for increased bandwidth and connectivity.
Kentucky	1-Aug-2003	0	22		
Louisiana	1-Jul-2002	10	37	No	
Maine	16-Dec-2003	0	43	Yes	The scoring system awards points in this area.
Maryland	1-Oct-2002	8	11	No	
Massachusetts	6-May-2002	32	46	Yes	The Department works with 132 school districts to leverage all NCLB fundings through alignment with LEA school improvement plans under the consolidated grant application process. http://www.doe.mass.edu/nclb/
Michigan	1-Feb-2003	4	16	Yes	Michigan's funds will be dedicated to 1-1 computing at the 6th grade level. Districts are asked to use other funding sources to provide for additional professional development and total cost of ownership.
Minnesota	N/A	N/A	N/A	N/A	
Mississippi	15-Jan-2003	0	14	No	
Missouri	1-Jul-2002	0	40	Yes	All participating districts use the eMINTS program. This enables low rates through volume purchasing. Universities substantially reduced the tuition costs for credit hours associated with eMINTS professional development.
Montana	1-Jun-2003	6	6	Yes	Consortium grantees are encouraged to utilize the formula and competitive funding to create local support networks that achieve an economy of scale.
Nevada	23-Sep-2002	4	6	Yes	The EETT funding (80% professional development) is designed to complement and leverage the State funding (infrastructure and technical support).

*Consortia grants include grants awarded to high-need LEAs who applied in partnership with entities such as other LEAs, institutions of higher education, nonprofit organizations, or private sector businesses.

Table 4 (continued from previous page)

State	Release Date (Round 1)	Consortia Grants	LEA Grants	Leverage with Other Funds	Strategies Used to Ensure Leveraging of EETT through Other Funds
New Hampshire	30-Mar-2003	4	4	Yes	We have designated the Local Education Support Center Network as a priority vehicle for outreach to our LEAs through multiple grant sources—including EETT.
New Jersey	7-Nov-2002	4	24	No	
New Mexico	1-Jul-2003	4	39	Yes	Collaboration is highly encouraged due to high need, rural nature of the state, and limited funding.
New York	20-Jan-2004			Yes	Applicants are asked to document how they plan to promote infused technology that realizes effective teaching and learning through collaboration with other NCLB program funds.
North Carolina	1-Apr-2003	0	20	No	
North Dakota	15-Jan-2003	3	26	No	
Ohio	1-Jul-2003	0	57	No	
Oklahoma		0	44	No	
Oregon	20-Feb-2003	0	12	Yes	The consolidated application for federal funds requires districts to use federal funds to address needs and meet goals established through local data analysis.
Pennsylvania	9-Dec-2002	0	87	No	
Rhode Island	1-Aug-2003	1	8	Yes	LEAs are encouraged to finds ways to augment their federal grant activities with the State aid funds.
South Carolina	17-Sep-2002	5	15	Yes	Districts receive bonus points for providing matching and/or in-kind contributions.
South Dakota		14	0		
Tennessee	1-Apr-2003	0	25	Yes	Recipients must pledge local dollars to sustain the technology coach position for two years following the grant year.
Texas	19-Feb-2003	27	4	Yes	Applicants are required to describe how they use state funds (technology allotment funds, telecommunications infrastructure funds, E-Rate, previous TLCF grants, etc.) in support of the EETT program. Applicants also indicate uses of Title II D formula funds that align to state programs. The scoring rubric reflected the emphasis on leveraging funds as well as coordination/collaboration.
Utah	6-Mar-2003	5	0	Yes	Although not required, LEAs were encouraged to work within their districts to develop comprehensive programs that would leverage expertise, funds, and other resources.
Vermont	1-Jul-2002	11	32	Yes	Leveraging was achieved mostly through the consortia approach—having LEAs and other entities coordinate and collaborate will cut down on the repetitive nature of their work.
Virginia	1-Mar-2003	8		Yes	Applicants are asked to show how the EETT program complements state initiative funding.
Washington	1-Jul-2003	48	234	Yes	Title V, Innovative funds and Title II, Part A teacher quality programs are working together in some districts.
West Virginia	1-May-2003	0	15	Yes	Funds from other areas may be included.
Wisconsin	7-Nov-2002	20	3	Yes	The focus on professional development in the EETT program leverages state and local investments that are targeted on access to the Internet and the acquisition of hardware.
Wyoming	5-Dec-2003	1	15	Yes	The Title II Part D funds built on the state's provision of funds for connectivity, hardware, etc. Qwest is the state contract provider and often a partner in these applications.

*Consortia grants include grants awarded to high-need LEAs who applied in partnership with entities such as other LEAs, institutions of higher education, nonprofit organizations, or private sector businesses.

Project Alignment to NCLB Purposes

Section 2402 of the NCLB Title II, Part D legislation clearly outlined nine purposes for the legislation. Listed below are descriptions of competitive grant awards that represent clusters of awards addressing those purposes. This alignment is a result of states' competitive grant processes.

Table 5: Competitive Awards Targeting Specific Purposes in NCLB II D

Purposes of NCLB, Title II D	State	Representative Competitive Awards
(1) To provide assistance to States and localities for the implementation and support of a comprehensive system that effectively uses technology in elementary schools and secondary schools to improve student academic achievement.	WI	The NExTT project will empower a consortium of 13 school districts to build greater capacity to affirm student proficiencies in all academic areas, with a special focus on specific areas of need in the consortium, such as Instructional Technology, Language Arts, and Math. The NExTT consortium has three goals: 1) to increase PK-8 student achievement in math and language arts and align curriculum to DPI's ITL standards matrix; 2) to promote technology integration into the classroom by utilizing professional collaborative partnerships/learning communities; and 3) to provide leadership support to school administrators, incorporating research-based standards for administrative leadership to ensure effective curriculum/technology integration and assessment.
(2) To encourage the establishment or expansion of initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local educational agencies.	OR	David Douglas School District Tech Everyday Project. The Tech Everyday Project is a collaborative effort between David Douglas School District, Oregon Public Broadcasting, and the Multnomah Education Service District to provide widespread access to a streaming video library with lesson plans, activities, training, support, and "Techsperts," who will mentor teachers.
(3) To assist States and localities in the acquisition, development, interconnection, implementation, improvement, and maintenance of an effective educational technology infrastructure in a manner that expands access to technology for students (particularly for disadvantaged students) and teachers.	AZ	The Graham County Education Consortium (GCEC) is comprised of seven rural districts, an accommodation school, one charter school, Eastern Arizona College, and Graham County. Originally, GCEC members were unable to obtain Internet access because the needed telecommunication services did not exist in their communities. As a result, the members formed a consortium and built their own wide-area, wireless, and fiber-optic network. The WAN now connects 18 schools, one library, and the University of Arizona's Agricultural Experiment Station to each other and to the Internet. The schools have also teamed up with Eastern Arizona College and now use the WAN to offer distance-learning classes to the students and adults in their communities.
(4) To promote initiatives that provide school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction that are aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.	AR	Southeast Arkansas Education Service Cooperative (SAESC). In these high-need, Delta-area schools, the lack of adequate training for teachers prohibits students from acquiring the problem solving/critical thinking skills required on criterion-referenced state tests. This project includes 21 school districts. The SAESC will direct this program, which will provide intensive, year-long professional development training on research-based practices for teachers who use technology as a tool for teaching and learning in all subject areas. Each teacher in the project will receive ten full days of professional development over a one-year period, establish a model project/problem-based classroom, complete ten curriculum-integrated projects using technology, develop two curriculum-integrated units based on the Arkansas Framework, and mentor another classroom in their school or in Southeast Arkansas via interactive technology.

Table 5 continued from previous page.

Purposes of NCLB Title II D	State	Representative Competitive Awards
(5) To enhance the ongoing professional development of teachers, principals, and administrators by providing constant access to training and updated research in teaching and learning through electronic means.	SC	Dillon Teams, a cooperative, innovative, technology project between Dillon School District One and Dillon School District Three, will use technology and Internet-based resources to increase and enhance instructional environments for students. Teachers and staff will use online classes to learn about best practices of teaching and more advanced ways to incorporate technology into the classroom. Students and parents, though the districts' current laptop checkout programs, will be able to access school and Internet-based resources through local dial-up access. Dillon Teams use technology to increase accessibility and enhance instruction for all members of the community, including students, parents, staff, teachers, and administration.
	AZ	Graham County Education Consortium has teamed up with Eastern Arizona College (EAC) and EdTeching, a group of Northern Arizona University professors, to provide professional development opportunities to all teachers, principals, and administrators in Graham and Gila Counties. EAC provides needed training concerning the use of hardware and software in the classroom. Teachers are trained to use all Microsoft applications, PDAs, scanners, digital cameras, etc., and to implement the use of those technologies in the classroom. EdTeching has helped the consortium form a "Community of Leadership," consisting of teachers, principals, and administrators representing each of the member schools. The EdTeching professors first teach the Community of Leadership at their own schools to exponentially promote the use of technology in the classroom.
(6) To support the development and utilization of electronic networks and other innovative methods, such as distance learning, of delivering specialized or rigorous academic courses and curricula for students in areas that would not otherwise have access to such courses and curricula, particularly in geographically isolated regions.	MD	The Maryland Students Online Consortium (MSOC), a partnership of 14 local school systems (led by Baltimore County Public Schools), will review, offer, evaluate, modify, and recommend online courses for the Maryland Virtual Learning Opportunities Program (MVLOP). MVLOP is an educational service managed by the Maryland State Department of Education that is designed to expand Maryland public school students' access to challenging curricula aligned to the Maryland Content Standards and other appropriate standards through the delivery of high-quality online courses. Implementation of MSOC goals and objectives fall into two major activities: 1) support the work of the consortium as members learn more about implementing local online programs for students, and 2) support local activities, including the provision of student courses and professional development for planning and implementing online learning for students.
(7) To support the rigorous evaluation of programs funded under this part, particularly regarding the impact of such programs on student academic achievement, and ensure that timely information on the results of such evaluations is widely accessible through electronic means.	KS	The purpose of this program is to provide evidence that technology-rich learning environments that are supported by strong, ongoing professional development can produce positive changes in the classroom environment and can result in improved student achievement in the areas of reading, math, and science. The program is based on the success of Missouri's eMints.
(8) To support local efforts using technology to promote parent and family involvement in education and communication among students, parents, teachers, principals, and administrators.	IN	In Wayne, outreach, take-home PDA's, distance learning, enhanced assessments, and extensive staff development are all being used to increase student achievement in language arts and math among junior high ESL students. This program also benefits students' families. As the family connection is strengthened, younger siblings will learn through modeling. The program serves over 1,100 students with multiple languages; more than 900 families are participating.

State Leadership and Administration of NCLB Title II D

State Activities – Technical Assistance and Program Administration

Section 2415 of NCLB Title II D limits state activities to 5% of the total state allocation. State use of those funds was in two primary areas: technical assistance and administration. With administrative dollars restricted to 60% of the 5%, states reported a range of 0% to 60% with a majority of the states (27) at the maximum allowed. Consequently, most states reported using 40% of those funds for technical assistance. The range for technical assistance was 20% to 100% of the 5% allowed for state activities. Examples of the technical assistance provided to LEAs are included in the chart below.

Table 6: Examples of Technical Assistance Provided by States

State	NCLB Title II D Technical Assistance
AL	Technical assistance is offered through various means. One is the development of ALEX, the state Web portal for teachers, which has lesson plans and promising practices aligned to state standards. Another is through workshops and grant writing assistance at the Alabama Educational Technology Conference. Still another is through statewide training, curriculum training, and website development for T4: Teens and Teachers Teaming for Technology (modeled after the GenY program). Regional technology specialist contacts are also available at the state department for assistance with technology planning, monitoring, and other issues.
DE	Professional development in such areas as LoTi (Levels of Technology Implementation), Unit development using Understanding by Design, speakers/workshops with David Loertscher, literature, and evaluation being conducted by RBS (Research for Better Schools).
KY	Student and teacher access to instructional resources and abilities to access and use audio/video via the state network was enhanced through an upgrade to the state infrastructure to districts and schools. Technical assistance in implementing this resource was provided through OET staff and KETS Area Engineers (OET staff). Meetings are held regionally with district technology leaders, and staff worked with district technology staff to maximize network capacity for schools. State leadership held regional meetings with technical, instructional, and district leadership on how this infrastructure could support student and teacher access to tools and resources for classroom learning.
MO	Funds were used to partially match the Gates grant and administer the Technology Leadership Academy, assist districts in developing education technology plans that address NCLB goals and objectives, train and support "local experts" in providing technology planning assistance to schools across the state, target high-need districts and provide specialized assistance to help them apply and be approved for FY04 competitive grants, and support "summer samplers" across the state that promote technology integration and training on the use of certain technologies (hardware and software).
MS	The funds were spent conducting statewide and regional meetings on technology planning, providing statewide professional development on curriculum/technology integration, and capturing "best practices" in teaching with technology on video/DVD/videostreamed data to schools.
PA	Technical assistance was provided to LEAs through a three-day grant writing workshop, onsite visits, review and discussion of biannual reports, and collection and dissemination of survey data to the LEAs and teachers to determine professional development needs.
TX	Technical assistance includes assistance in developing applications for formula and competitive grants, coordination of evaluation strategies by all recipients of formula and competitive grants, development and use of a system to document progress of educators in meeting standards for educator proficiency, and support for the Technology Applications Teacher Network and Technology Applications academies to provide statewide resources and professional development modules to support the implementation of the state technology applications curriculum standards.
VA	Three TA specialists have been hired to work with other DOE specialists to provide TA to districts.
WI	Information resources include Web-based materials; e-mail distribution list or listserv; sample technology plans; sample successful proposals; and selection of best-practice examples. Personalized technical assistance includes state-wide conference and regional briefings to discuss competition requirements; training session for grant writing; training sessions for developing technology plans; feedback on district technology plans; assistance with developing evaluation plans; district visits; telephone/e-mail help lines. The provider(s) of TA (sponsored by the SEA) include the SEA, the Intermediate Units (e.g., Regional Centers), and the Regional Technology in Education Consortia (RTECs).

Nine percent of the states (19.1% of respondents) reported consolidating the administrative funds for Title II D with other federal programs. Two comments follow from states in which administrative tasks were consolidated:

> *"This move takes the accounting and fiscal management burden off the program manager, allowing the program manager more time on-task in implementing the program. The agency is also able to implement programs more efficiently and create resources that will impact student achievement in the implementation of NCLB."*
>
> *"The federal pool for FY03 was such that we were able to earmark most of the Title II D administrative funds for technical assistance activities as detailed above."*

In general, **survey respondents felt that too few dollars were allowed for state administration and technical assistance for NCLB Title II D**, especially given the requirements for managing dual programs (formula and competitive grants) that require different processes.

Impact of Dual Programs

Respondents felt that the dual programs in NCLB Title II D provided a needed balanced between equity of access to resources and targeted substantive funding for in-depth, innovative, comprehensive programs that led the way in meeting the goals of the program.

The challenge identified by the state directors was not in structure but in too few program dollars to allow all grant recipients to substantively make gains toward the goals of the program. That also holds true for the state leaders. Respondents commented on the difficulty of comprehensively providing technical assistance and administrative support for dual programs. In fact, most states, after providing initial technical assistance and ongoing administrative support, have few funds remaining to build the capacity of their LEA constituents in high-need areas such as integration into standards-based curriculum, online learning, professional development, and especially evaluation and assessment of the program's impact on learning. Listed below are samples of survey respondents' comments regarding the impact of the dual funding structure.

How does this dual funding structure affect your state's ability to reach the NCLB II D program goals?

- *The formula piece is more difficult to manage since all districts have their own needs and are site-based decision-makers. It is more challenging to monitor their progress towards the goals and be a part of their process. The competitive structure allows the department to be more prescriptive and focus on technology integration needs. It also allows freedom in areas, however, there is room to make sure we are all working together toward the same goals for our students. Competitive grant participants make more of an effort to work in collaboration with the grant to make technology initiatives happen.*
- *The formula funds dilute the funds to a very insignificant amount for some schools.*
- *The dual structure enables our state to target different segments of the work in schools. The funding works in concert but the ability to target some high-profile programs with a bit more money for the competitive portion will be very effective, if the early reports are indicative.*
- *The dual funding structure enables the State to work toward equity of resources, training, and infrastructure.*
- *For the competitive application, funds are available to carry out the scope of the projects. Most applicants who received competitive funds combined these funds with their formula funds to meet their needs. Those districts receiving formula-only funds must relate those funds to their approved technology plans. Thus, regardless of the amount of funds, they are directed to their needs as described in their plans.*
- *The way it is divided out, there are not enough funds to support any one effort. Needs to be either formula or competitive.*

How does this dual funding structure affect your state's ability to allocate funds to high need populations?

- *Title II D funds assist in providing support to our high-poverty districts, however, we have needs in many of our state's rural communities where the amount of formula funding is too small to have any impact.*
- *There are few high-need populations that are concentrated enough to receive sufficient formula funds to make a difference. Most of the high-need students are spread throughout our 426 public school districts, 79 percent of which have total student populations under 2,500.*
- *The requirement of NCLB/EETT to focus resources on high-need LEAs and close performance achievement gaps has enabled state education agencies to distribute needed resources towards LEAs in need of help. More important, the allocation of funds is directly tied to effective use of technology for student performance improvement.*
- *Because of the definition of high-need populations, the eligibility criteria change from year to year. The ability to apply and continue to receive funds from year to year is not guaranteed and leads to instability in planning and implementation.*
- *Through the dual structure, the state is better able to reach more (quantity) LEAs that have a high-need population; however, unless an LEA receives competitive funding, the formula portion of their award may be too insignificant in size to provide any measurable results (quality).*

How does this dual funding structure affect your state's ability to equitably distribute program funds?

- *Unless we developed a consolidated approach around the regional offices, there would have been no equity.*
- *Some needy schools are not eligible and the formula funds make some of the awards insufficient to produce viable projects.*
- *Because funds are distributed based on poverty calculations, districts that have more students with greater needs are receiving more funding. Often this means that more affluent school districts may receive as little as $2,400, but in combination with other local and state funds, these districts are finding ways to combine non-federal funds to integrate technology in the classroom.*
- *Formula funds seem to address this, however, it is difficult to understand how the schools that receive very limited funding are able to impact learning using technology. The competitive funds allow funds to be more equitable in most areas.*

How does this dual funding structure affect your state's ability to efficiently administer program funds?

- *Dual funding structure required additional work at all levels.*
- *Having two funding programs makes it difficult to administer the program in terms of helping districts understand the logistics and guidelines for the two types of funding. Data collection is also more complicated with the dual program concept.*
- *Realistically, the amount of time and effort required for a reimbursement-based program, under which a district of several hundred students may receive $2,000 or less, is very cost inefficient. The amount of funding becomes sufficient only in districts of extremely high poverty or 1,000 students or more.*
- *Using an online approval process to receive funds and comprehensive program site review helps to efficiently administer the program.*
- *Because of the formula/competitive split, this program has actually become twice the workload as TLCF. The program could be more efficiently run as a single competitive grant.*

How does this dual funding structure affect your state's ability to assess the program's impact?

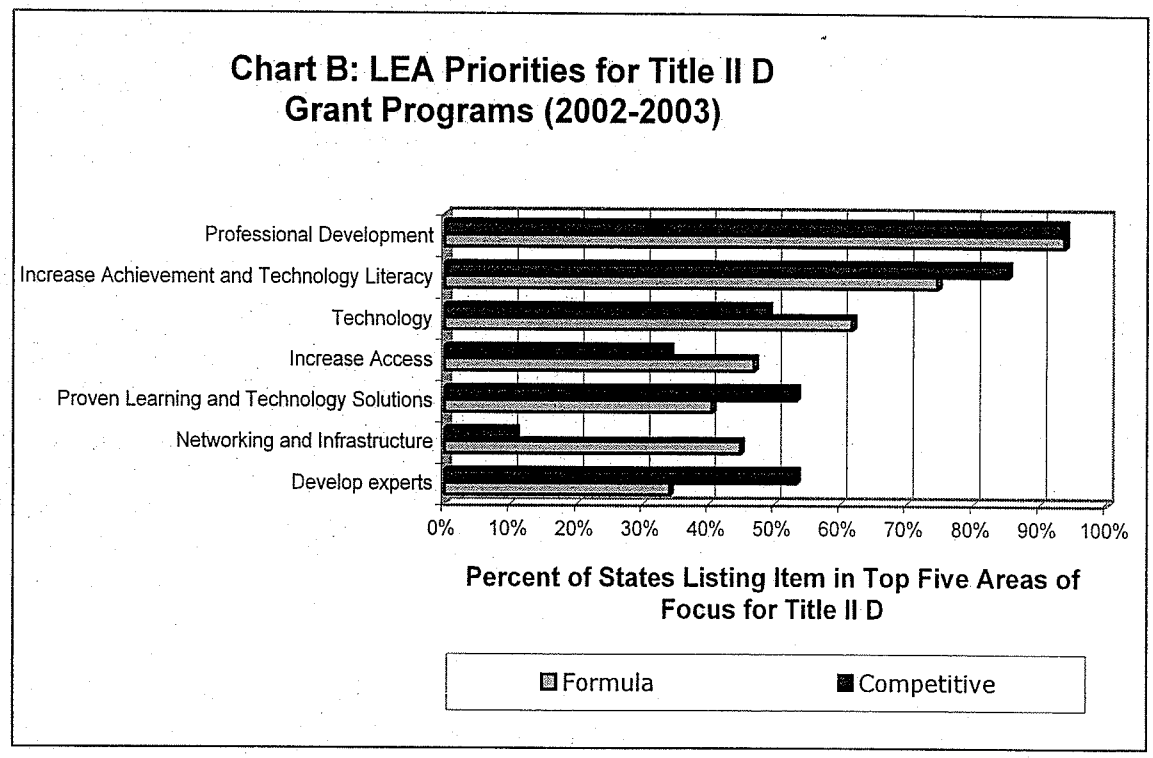
- *All formula and competitive recipients must complete an evaluation plan that outlines their goals, expected outcomes, and the data they will use to measure outcomes. They must complete interim and end-of-project reports that address their program's impact.*
- *The dual funding structure of this program makes it difficult to assess the program's comprehensive impact. The impact can be assessed at the competitive level but the minimal funding amounts for some LEAs under the formula funds make assessment of impact difficult at best.*
- *The dual funding sources enable data to be collected and assessed statewide.*
- *The competitive program can assess impact much more readily than the formula grant program. As described above, some of the grant amounts are too small to have much impact. Also, districts mingle the grant funds with other funding which makes it difficult to isolate what each funding actually supports, and, as encouraged, districts use technology as a tool to support a variety of activities and this mingling of technologies and activities makes it difficult to identify, isolate, and attribute cause and effect. We should be looking at the overall and end results. How do we reconcile telling districts to use all of their NCLB funds (and state and local fund) in meaningful ways that improve teaching and learning and then later ask them to determine what pot of money made the greatest impact?*
- *This is impossible. We have insufficient funding to set up the data collection that we need. Add to that the requirement that impact must be measured with scientifically-based research. The only evaluation tech grants funded had limited focus in order to meet the strictest interpretation of scientifically based research and therefore we cannot evaluate the impact of the programs instituted in II-D properly.*
- *Assessment remains a difficult task. Each project is required to submit an evaluation plan and a year-end report. However, we need a statewide initiative for evaluation on a common set of data elements.*
- *The administrative funding is not sufficient to do this evaluation.*

How does this dual funding structure affect your state's ability to change classroom practice?

- *Only those recipients that received significant funds can be expected to actually change classroom practice. Many of our competitive projects and districts receiving significant formula funds hold great promise for such change.*
- *It is uncertain at this time how the dual funding structure affects classroom practice. The competitive grants consisting of at least $30,000 have a greater chance of impacting classroom practice than the formula funds that may be of minimal amounts. Additionally the competitive portion provides for more "quality control" than the formula funds.*
- *Due to the size of grants with the formula funds, it is difficult to change classroom practice and make a large impact. Since the competitive grants are of a sizeable nature, the change in classroom practice is more likely to occur and be sustained over a period of time.*
- *Formal evaluation studies are currently under way, but data from the technology integration specialists in terms of weekly reports and meetings show very positive results in terms of the classroom teachers integrating technology into their curriculum.*
- *The formula funds received at the district level are often not sufficient to change classroom practice. The competitive funding, however, is doing that exactly by establishing models, providing ongoing, quality professional development, and examining online learning integration tools.*

Finding 1: A Shift in Emphasis from Technology to Learning

State Directors report that the NCLB, Title II, Part D program is a positive force in refocusing technology use toward gains in student learning. The Title II D program goals are high priorities for all grant recipients, with emphasis varying between formula and competitive grant programs.



One of the major differences between the uses of formula and competitive grant funds is level of innovation. Because many formula grants are small, they tend to be used to sustain existing programs. The competitive funds, on the other hand, are substantive enough to have a long-term effect through changes in classroom practices. Note that the competitive grant places more emphasis on "Proven Solutions" and the "Development of Local Experts," both of which are essential to local innovation leading to effective practice. Findings suggest that two new areas, Data Management/Decision-Making and Assessment of Impact, will find their way onto this chart within the next few years.

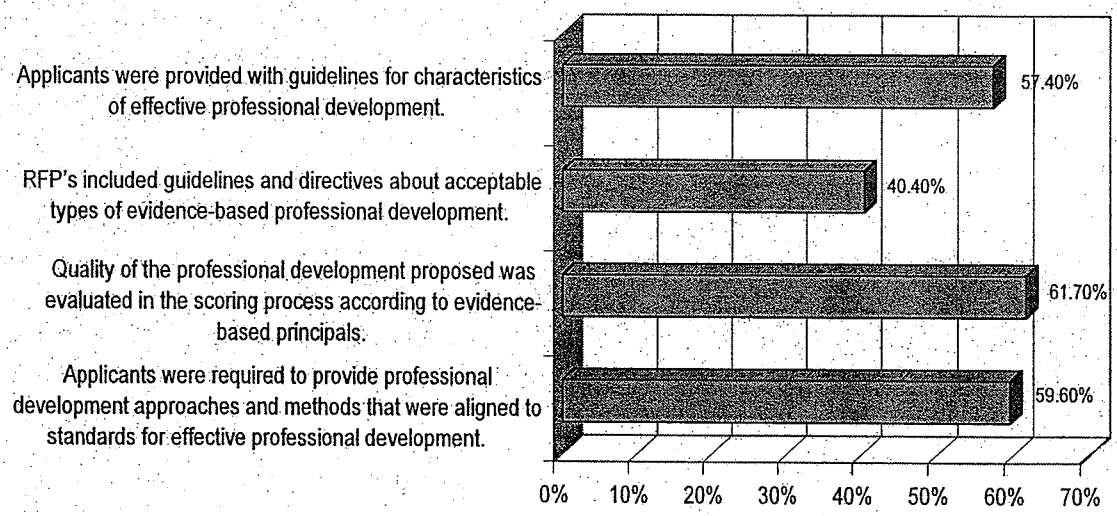
Finding 2: A Focus on Professional Development

The NCLB, Title II, Part D legislation requires that all grantees for formula and competitive grants use a minimum of 25% of the funds for professional development aligned to program goals. While a waiver of this requirement was possible, less than 1% of LEAs and/or consortia grantees applied for and received such a waiver. Thus, at least 25% of the total grant funds awarded to respondents (over $137,000,000) was dedicated to professional development.

State coordinators for Title II D are establishing criteria and providing technical assistance to ensure high-quality professional development from LEA and consortia awardees. Twenty-eight of the 47 state respondents (59.6%) required their competitive grant applicants to align professional development to state teaching standards; 22 states (46.8% of respondents) required alignment to the ISTE NETS for teachers; and 18 states (38.3% of respondents) required alignment to state-adopted technology standards for teachers.

The chart below lists the percentage of states setting criteria for professional development in the Title II D competitive grant process and provides an indication of how directive states were with professional development criteria.

Chart C: Methods by Which Respondent States are Addressing Professional Development Requirements in the Competitive Grant Process



States are setting high standards for professional development provided through the Title II D program.

Finding 3: Doing More with Less through Collaborations and Partnerships

The federal NCLB legislation aligns all programs to a common goal of student achievement as measured by each state's Adequate Yearly Progress (AYP). This common target has resulted in consolidated applications; application requirements for leveraging funding across programs; the building of consortia that work together through competitive grant awards; and the consolidation of administration and technical support for federal programs.

State Directors' comments:

"The consolidation enabled the various Titles to leverage resources."

"We mandated that Title II D competitive funds be used in coordination with other funding programs, especially Title I."

"State leadership continues to work with districts in using total dollars (federal, state, and local resources) to address the requirements of NCLB."

"Competitive grants were awarded to school districts that have formed technology partnerships…The partnership funding allowed for an economy of scale to be established whereby the funding could have a stronger impact than if the funds were distributed to individual districts."

Through such collaboration and coordination, findings indicate that schools are opting to use the flexibility of the federal guidelines to dedicate additional funds to technology and learning. In the first year of the program (2002-2003), the following transfers within the formula grant funds occurred, for a net gain of $2,323,302 to Title II D.

Table 5: Fund Transfer

Funds transferred **OUT** of Title II D to other programs	Funds transferred **IN** to Title II D from other programs	**Net Gain**
$1,934,431	$4,257,733	$2,323,302
Note: Most oft cited programs receiving Title II D funds were Title I, Title II A, and Title VI B	*Note: Most oft cited programs contributing funds to Title II D were Title II A, Title V Part A, Title IV A*	

Leadership and partnership at the state and regional levels have also lowered costs in the area of telecommunications. Nineteen states (40.4%) report providing low-cost, high-speed networking services for all LEAs, with three states (6.3%) providing special subsidies for high-need schools. Sixteen states (34.0%) reported having no subsidized or low-cost, high-speed networking services for schools with high percentages of high-need students.

While most states have taken the first steps toward program collaboration, and LEAs are beginning to work with outside partners within the Title II D program, much remains undone. Until the structures of the system shift, true collaboration will remain difficult to achieve.

Finding 4: Using the Formula Grants to Sustain Existing Programs

Over 90% of the 15,040 LEAs represented by survey respondents were eligible for formula grants. Many states indicated that the formula grants were important to their districts, particularly in sustaining their existing technology programs. Districts that received sizeable formula awards have more options in using the funds to continue or develop existing initiatives.

Survey respondents reported that, of the LEAs eligible for awards in the locales represented, 871 (6.2%) either refused the award or didn't apply. The major reason cited for this was that, "the amount of funding was insufficient to warrant the effort." Further analysis finds that 51.0% of the recipients were awarded $5,000 or less, and 83.1% were awarded $20,000 or less for their annual Title II D formula grant award (see below for details). Survey respondents report that the high numbers of grant recipients are further stretching states' administrative and technical assistance budgets.

Title II D program administrators are concerned about the focus on breadth at the expense of depth of impact on learning. In response to an open-ended question about issues related to the first year of implementation, over one-third of respondents cited the "size of the formula grants." The following comments are representative:

> *"The formula allocations to the majority of our LEAs are too small to make an impact towards seeing that no child is left behind. Approximately 80% of the awards are below $20,000. How can you impact or enrich technology integration with such small awards?"*

> *"Having to deal with 802 applicants, with the majority of them receiving less than $10,000, is nearly unmanageable. And it will probably not result in increases in achievement that can be specifically targeted to technology."*

Chart D: Year 2002-2003 NCLB II D Formula Awards to Local Education Agencies (LEAs)

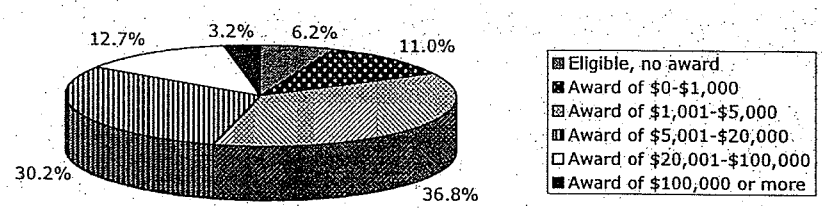


Table 6: Competitive Grant Allocations to LEAs

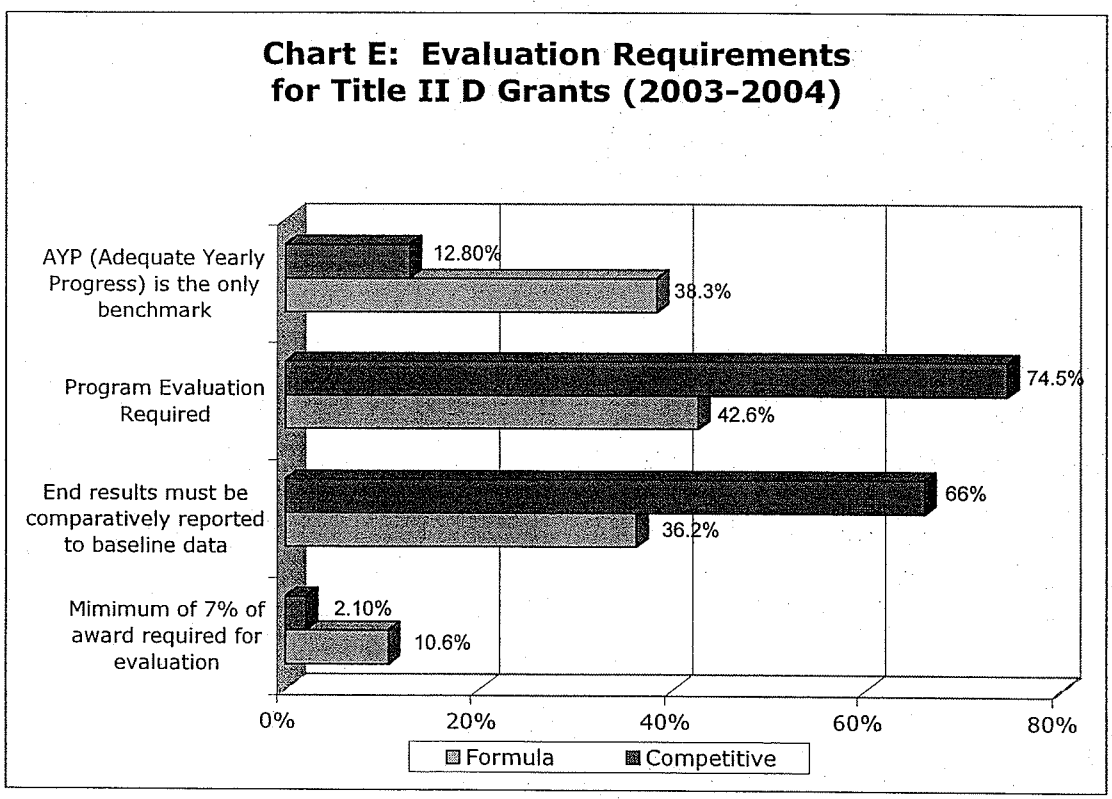
	LEAs not eligible	LEAs eligible but refused or didn't apply	LEAs with awards between: $0 and $1,000	$1,001 and $5,000	$5,001 and $20,000	$20,001 and $100,000	LEAs receiving $100,001 or more
Number of LEAs	1,462	871	1,552	5,167	4,244	1,779	443
Percent of eligible LEAs		6.2%	11.0%	36.8%	30.2%	12.7%	3.2%

Finding 5: Evaluating Effectiveness Requires State Leadership

In this era of high-stakes accountability, nearly all program administrators express a keen interest in assessing the effectiveness of the NCLB program. However, most are struggling to do so due to a lack of funding targeted to evaluation and assessment. According to survey respondents, the lack of sufficient funds at the state level makes it difficult to provide the leadership, guidance, and electronic data collection systems necessary to evaluate the effectiveness of both the formula and competitive grants. Several states also cited the lack of federal guidance for evaluation as a hindrance to quality evaluation.

Twenty-seven states (57.4% of respondents) report that they are conducting a state-level evaluation of Title II D competitive grants. Several states reported that they would aggregate data from local evaluators to compile a state report; some reported partnering with local universities to conduct the evaluation; and still others required LEA or consortia grantees to subcontract for evaluation with a designated outside evaluator. A few planned to use trained SEA evaluators, and most states expected to use a portion of the 5% of Title II D allowed for administration. A few mentioned state evaluation grants from the U. S. Department of Education.

The difference between the evaluation processes for the formula and the competitive grant portions of Title II D is striking. Finding it extremely difficult to monitor the formula grants, at least eighteen states are using AYP (Adequate Yearly Progress) as the single indicator of formula grant effectiveness. That number drops to 6 for the competitive grants, with most states requiring comprehensive program evaluations from competitive grant awardees. Over a third of the survey respondents are providing guidelines and training for program evaluators of the competitive grants. However, most states also report an inability to conduct adequate program evaluations, associated trainings, and facilitation of exchanges among grantees due to a lack of state funds for this purpose.



Note: Percentages are based on the number of survey respondents (47).

Issues raised by survey respondents related to evaluation are represented by the following comments:

> *"A major concern is having enough staff to administer the program, particularly the facilitation of the partnership grants, and sufficient funds and staff to conduct an in-depth evaluation."*
>
> *"[There are] no federal guidelines on evaluation requirements."*
>
> *"Although guidance for implementation was provided, guidance to evaluate and report on the implemented programs was not given. Not knowing the expected reporting parameters has led to uncertainty for the SEA and potentially unnecessary data collection for the grantees."*
>
> *"[There is] insufficient funding for program evaluation."*
>
> *"The burden of monitoring the effective use of funds is difficult. For a minimum award state, the problem is especially acute, as there are insufficient human or monetary resources to operate a genuine evaluation component. An anecdotal one, or one without a truly objective observation and measurement component, is not worth any time or money spent."*

Despite the barriers, some states are beginning to provide readily available, online access to student achievement data. In fact, 36 states (76.6% of respondents) report having a common, statewide system for reporting and/or disseminating school data. Seventeen of those states (36.2% of respondents) provide professional training on using the data to drive better instructional decisions. Eighteen states (38.3% of respondents) already collect and report data on school technology, with nine (19.1% of respondents) collecting data on educator and student technology proficiency.

Survey respondents report that LEAs need guidance, training, and leadership in this area. Without additional state-level flexibility in the use of funds for assessment, an opportunity to document the impact of these funds will be missed. With many states weighing in as novices in this process while others discuss in-depth, reflective evaluation processes, this is definitely an area of need. States could benefit greatly from a national learning community around the issue of "What Works."

Finding 6: A Knowledge Base Is Emerging

Most NCLB, Title II, Part D administrators viewed the competitive grant process as an opportunity to advance Title II D learning goals through substantive, innovative approaches to technology-enriched learning. The application processes varied considerably across the states, with some states specifically focusing their use on aligning with current state directions (e.g., Virginia: professional development; Washington: middle school mathematics; Michigan: wireless laptops for 6th graders; Delaware: reading and writing; Missouri: eMints [grades 3-5 multimedia learning]; New Jersey: language arts literacy; Utah: classroom models for inquiry-based student access), while others simply used the federal guidelines.

It is apparent from the survey that state and Washington D.C. technology directors are using frameworks, standards, and experience to design technology-based learning programs to advance Title II D goals. What is not apparent is a wide-scale effort to establish a common knowledge base of sound research practices, or to conduct research studies that will establish that common knowledge base for technology-enriched programs. More than 50% of survey respondents use existing sources, such as the Regional Technology Education Centers (63.8% of respondents), the ISTE Caret site (44.7% of respondents), and the Regional Educational Labs (53.2% of respondents) to inform decision-making related to technology and learning, but few go directly to source journals (10.6% of respondents). This is indicative of busy professionals who need the information analyzed and indexed by reliable sources.

Table 7: Representative competitive grant programs

Focus	State	Description
Learning communities	TN	EdTech Launch: Thirteen LEAs will work together with a technology coach in a whole school professional development environment assisted by a mentor school from the prior competitive program.
Reading and writing	NJ	The STAR-W (Students using Technology to Achieve Reading-Writing) uses technology to improve student reading and writing.
Online courses and resources	AL	SchoolWeb Leaders will engage 20 schools in the development of school websites and class Web pages, as well as online courses.
Reading and Writing/Online Resources	DC	An online Collaboratory is being created to support improvement in high school student writing. Using video conferencing tools and Vantage Learning's "My Access" online writing resources, educators are creating a virtual community of learners focused on reading, writing, and improving upon each. This is currently slated to pilot in the fall of 2004.
Mathematics	MA	The SELECT Math Project will provide professional development activities and materials to enable teachers to effectively integrate technology into mathematics teaching and learning in middle schools throughout Boston.
Assessment	MD	The Maryland Online Technology Profiles for Teachers and Administrators Consortium is developing and piloting online profiles of technology skills (based on the Maryland Teacher Technology Standards—MTTS) that have been approved by the Maryland State Department of Education and the national Technology Standards for School Administrators (TSSA).
Inquiry-based/ problem-based learning	MO	eMINTS: A professional development program that helps teachers (grades 3-5) integrate multimedia technology into local curricula through practices that promote inquiry-based, problem-based, and collaborative teaching and learning.
Communication and writing	ID	WolfDen: A TV and radio broadcasting program designed to improve students' writing and communication abilities, technology skills, and analytical and synthesizing abilities, fostering a new vehicle for communication between parents, teachers, and students about education and curricular concerns.

The U.S. Department of Education has identified the documentation and dissemination of research-based practices as a critical outcome of this grant program. Yet in this first year of competitive grants, only 40.4% of state administrators plan to analyze comparative evaluative data from projects such as the ones listed above to track and publish what appears to be working. Those states that are planning to formally document their successes and disseminate their findings plan the following strategies: posting "what works" on their Web sites; hosting regional and state meetings for the purposes of sharing successes; datacasting via public television; designating model visitation sites; making presentations at professional organizations' meetings; videoconferencing; and creating print and electronic newsletters.

Appendix A: Representative Projects Matched to NCLB Purposes

Section 2416 of the NCLB, Title II, Part D legislation requires that all local grantees use not less than 25% of funds for professional development and lists nine other activities that might be included.

The pages that follow outline grant programs in various states where these activities are being funded through Title II D competitive grant awards.

Professional Development. Professional development that provides school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.

State	Project Title and Location	Project Description
AR	Southeast Arkansas Education Service Cooperative	In these high-need, Delta-area schools, the lack of adequate training for teachers prohibits students from acquiring the problem solving/critical thinking skills required on criterion-referenced state tests. This project includes 21 school districts in Southeast Arkansas. Fifteen of the 21 meet the definition of high-need LEAs. The Southeast Arkansas Education Service Cooperative will direct this program, which will provide intensive, year-long professional development training on research-based practices for teachers who use technology as a tool for teaching and learning in all subject areas. Each teacher in the project will receive ten full days of professional development over a one-year period. Each will establish a model project/problem-based classroom, complete ten curriculum-integrated projects using technology, develop two curriculum-integrated units based on the Arkansas Frameworks, and mentor another classroom in the school or in Southeast Arkansas via interactive technology. Each participant will be given a high performance computer with Internet access, printer, scanner, digital camera, 32-inch TV and Aver Key, Office XP, Inspiration, and ten days of intensive curriculum integration training. Former participants trained with past technology grants will serve as program mentors.
MA	SELECT (Supporting Engaged Learning by Enhancing Curriculum with Technology) Boston Public Schools	The SELECT Math Project will provide professional development activities and materials to enable teachers to effectively integrate technology into mathematics teaching and learning in middle level classrooms throughout Boston. This professional development model will provide ongoing, embedded support to teachers through face-to-face workshops and courses, exchanges with colleagues, and mentoring through the use of the BPS Secondary Mathematics Department and Office of Instructional Technology staff. The project is designed to 1) develop and expand participants' knowledge of sophisticated tools designed to deepen mathematical understanding (e.g., Geometer's Sketchpad, Tabletop, Fathom, MathLab, and applets such as those available from NCTM at http://illuminations.nctm.org/pages/68.html); 2) increase teachers' skills in integrating these technology tools into the existing curriculum (Connected Math Project); 3) deepen content knowledge in mathematics; and 4) enhance technology literacy skills within the context of the instructional process.
PA	Integrate Technology Across the Curriculum Greensburg Salem School District	This project includes: 1) onsite teacher training and support (teachers receive 1 hour of training each week); 2) a teacher technology lab; 3) a website where teachers receive technology support and share ideas; 4) a technology newsletter from the student perspective; 5) participation in the Intel "Tech to the Future" program; 6) 2 days of technology training in the summer for district administrators; and 7) solar programs and probeware systems for use in science classrooms.

1) Increase Access. Establish or expand initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local educational agencies.

State	Project Title and Location	Project Description
OR	David Douglas School District Tech Everyday Project	The Tech Everyday Project is a collaborative effort between David Douglas School District, Oregon Public Broadcasting, and the Multnomah Education Service District to provide widespread access to a streaming video library with lesson plans, activities, training, support, and "Techsperts," who will mentor teachers.
SC	Marion 1 and Marion 7 Consortium – CREATE: Challenging Rural Educators to Advance Technology in Education	Marion School Districts 1 and 7 are one step closer to putting technology into the hands of every student and every teacher in each of their schools. Through a grant from the South Carolina Department of Education (and part of NCLB funds), the two districts have joined forces to form CREATE (Challenging Rural Educators to Advance Technology in Education). The grant will enable both districts to expand technology resources to students, not only through additional hardware and software, but also through comprehensive professional development that will equip teachers to integrate technology into all facets of classroom curricula and instruction. District officials say that this is particularly helpful since many students in both districts do not have access to technology in their home environments. "Without adequate technology in our schools, a large percentage of our students will never have the opportunity to experience technology and learn the critical skills needed to compete in today's technological workforce," says Dr. Jane Pulling, the CREATE project director. "This grant levels the playing field, and makes technology available to all students."
UT	Children Learning with Technology Logan School District	The Children Learning with Technology model incorporates and utilizes the teaching staff in Logan School District to challenge impoverished and partial/minimal mastery students through summertime participation in integrated technology programs, nature programs, and practical experiences that increase reading, writing, mathematical, and science skills.

2) Increase Achievement and Technology Literacy. Adapt or expand existing and new applications of technology to enable teachers to increase student academic achievement, including technology literacy.

State	Project Title and Location	Project Description
HI	Reforming Science Education North Complex Area	Reforming Science Education responds directly to the intent of NCLB. The project will focus on and improve standards-based instruction, science education, and the achievement of all learners, including diverse learners. This project will build upon existing initiatives and resources in the North Complex Area to achieve an integration of efforts aimed at scientific literacy for teachers and students.
OH	Lehman and Hartford Middle Schools; Fairmount Elementary Canton City Schools	The goal of this project, in alignment with our CIP, is to use the necessary tools to ensure that each student masters the Academic Content Standards' benchmarks and grade-level indicators, especially in reading and math, to ensure that "no child is left behind." CompassLearning, improved access and availability to technology, and professional development will provide Lehman Middle School and its community with the tools needed to support teachers and students in raising achievement. Scientifically based research affirms the use of technology to meet or exceed state standards, and the use of CompassLearning and auxiliary resources will enable teachers to assess and diagnose individual student needs, prescribe interventions and learning paths, and report student progress. Furthermore, it will provide parents and students with learning opportunities beyond the classroom and the school day through access to school programs as well as at home and community Web-based availability. Hartford Middle School is located in the heart of the inner city. Its relatively small size enables teachers to provide differentiated instruction and to develop caring relationships with students. This grant will be used to realize the district vision/mission of raising student achievement. This will be achieved through the use of Riverdeep's Destination Math and Achievement Technology's Learning Milestones. Both programs are aligned to state standards and provide direct instruction in the context of real-world applications. The usage of the YES Learning Software (Destination Reading, Destination Math, Learning Milestone, and Aspire) will implement and support a comprehensive Web-based program that will help to assess the growth and development of Fairmount Elementary students' achievement in the areas of math and literacy, as aligned to Ohio State Standards.
WI	The NExTT Project	The NExTT project will empower a consortium of 13 school districts to build greater capacity to affirm student proficiencies in all academic areas, with a special focus on specific areas of need in the consortium, such as Instructional Technology, Language Arts, and Math. The NExTT consortium has three goals: 1) to increase PK-8 student achievement in math and language arts and align curriculum to DPI's ITL standards matrix; 2) to promote technology integration into the classroom by utilizing professional collaborative partnerships/learning communities; and 3) to provide leadership support to school administrators, incorporating research-based standards for administrative leadership to ensure effective curriculum/technology integration and assessment.

3) Proven Learning and Technology Solutions. Acquire proven and effective courses and curricula that include integrated technology and are designed to help students meet challenging State academic content and student academic achievement standards.

State	Project Title and Location	Project Description
ID	Enhancing Reading Education Through Technology Payette School District	The Payette School District vision for improvement adopts the research-based premises that reading is fundamental to successful learning and that technology is an important tool. Research underscores the importance of reading achievement (Snow, Burns, & Griffin, 1998); reading failure must be prevented. Our goal is to ensure that every student, including the ELL child, is a fluent reader. This project proposes obtaining research-based software, needed hardware, and training necessary to use these technologies. Payette School District's partners in the proposed initiative are Albertson College of Idaho, Northwest Idaho Children's Home, and the Idaho Migrant Council.
IN	Evansville	This project aims to increase student achievement in math using project-based learning and basing the curriculum intervention on Kay Tolliver's approach for hands-on math instruction. The intervention focuses on changing teacher practice and includes a strong data evaluation component. Coaching, ongoing professional development, and collaboration are provided for teachers, and the school-community connection is strong.
MD	MDK12 Digital Library Project Montgomery County Public Schools – Lead LEA	The MDK12 Digital Library Project, led by Montgomery County Public Schools, will establish a purchasing consortium of 24 local school systems to provide a cost-effective way to deliver digital content that supports the teaching and learning of Maryland content standards in an equitable and timely manner for all students. By the end of the proposed three-year grant period, the consortium will have developed and implemented a business model for long-term sustainability of the project. Train-the-trainer sessions will be designed, conducted, and evaluated to determine their influence on enhancing teacher competency in the instructional use of online information databases. In addition, multiple data sources will report ways this digital content promotes student achievement.

4) Foster outreach and communications with parents. Utilize technology to develop or expand efforts to connect schools and teachers with parents and students to promote meaningful parental involvement; to foster increased communication about curricula, assignments, and assessments between students, parents, and teachers; and to assist parents in understanding the technology being applied in their child's education, so that they are able to reinforce at home the instruction their child receives at school.

State	Project Title and Location	Project Description
ID	WolfDen Productions Culdesac School	WolfDen Productions will improve the academic achievement and technology literacy of K-12 students at Culdesac School; enhance all curricula by increasing technology integration; and help teachers to employ more effective teaching methods. The project will use a core TV and Radio Broadcasting Program to improve students' writing and communication abilities, technology skills, and analytical/synthesizing abilities. By developing technology leaders on staff and using them to create collaboration plans with higher education institutions, businesses, and community agencies, the program aims to foster a new vehicle for communication between parents, teachers, and students about education and curricular concerns.
IN	Wayne	Outreach, take-home PDA's, distance learning, enhanced assessments, and extensive staff development are all being used to increase student achievement in language arts and math among junior high ESL students. This program also benefits the students' families. As the family connection is strengthened, younger siblings will learn through modeling. The program serves over 1,100 students with multiple languages; more than 900 families are participating.

5) Develop experts. Prepare one or more teachers in elementary and secondary schools as technology leaders with the means to serve as experts and train other teachers in the effective use of technology, providing bonus payments to these technology leaders.

State	Project Title and Location	Project Description
NM	Las Cruces Public Schools	Las Cruces Public Schools has a career track that support students who have selected teaching as their career choice. This project is making technology and PDA's an integral part of the high school students' course work. The program utilizes a partnership with NMSU and these students receive concurrent enrollment and credits for their participation in the program.
NV	Central Nevada Educational Technology Consortium	Uses a train-the-trainer approach for a 100% professional development project involving rural districts in central Nevada. These rural districts haven't participated much in Ed Tech or previous TLCF funding. The formation of this consortium created a vehicle through which smaller districts could benefit from Ed Tech funding, specifically the professional development component.
PA	Project SUCCESS Pittsburgh City School District	Project SUCCESS is a collaboration between Pittsburgh City Schools and Duquesne University to train teachers to use technology in the classroom. The project began in 8 of the most technology-advanced schools, with 100% staff buy-in at each. Teachers attended an intensive, weeklong summer professional development workshop, where mentors from Duquesne trained them on the use of technology for developing lesson plans and on harvesting information from the Internet. The mentors from Duquesne then spend an entire year at each school, working with teachers individually to ensure that they continued to advance and use technology-based lessons in their classrooms. During that same year, 3-4 teachers attended Duquesne to obtain credits to add an Instructional Technology certification to their teacher certificate and to assume the role of Duquesne mentors in the building for the following year.

6) Technology. Acquire, adapt, expand, implement, repair, and maintain existing and new applications of technology to support the school reform effort and to improve student academic achievement, including technology literacy.

State	Project Title and Location	Project Description
DC	Friendship Academy - PCS	This project involves the creation of Smartlab digital media studios to expand student learning environments. Expanded use of digital tools in non-traditional settings supports student learning and mastery.
ID	Education in the Palm of Our Hands Rockland School District 382	Rockland School Dist. 382, in conjunction with an EETT Formula Grant that addresses organization and study skills, will incorporate PDAs (personal digital assistants) into instruction. EETT Competitive Grant Project funds will be used to purchase PDAs loaded with organizational software for students in grades 5 through 12 and all teachers. Software will also be purchased in several curriculum areas. The main goal is to help students and teachers with their organization and study skills, helping them to become more motivated and increasing their self worth. A supplementary goal is to help students take responsibility for their own learning.
OR	Eugene, Klamath County, and South Lane School Districts	This project aims to increase student achievement and technology literacy, integrate technology into instruction, and expand access to technology through staff development, the acquisition and use of projection equipment, and the acquisition and use of student handheld computers and collaborative computer workstations.

7) Networking and Infrastructure. Acquire connectivity linkages, resources, and services (including hardware, software, and other electronically delivered learning materials) for use by teachers, students, academic counselors, and school library media personnel in the classroom, in academic and college counseling centers, or in school library media centers in order to improve student academic achievement.

State	Project Title and Location	Project Description
AZ	Graham County Education Consortium	The Graham County Education Consortium (GCEC) is comprised of seven rural districts, an accommodation school, one charter school, Eastern Arizona College, and Graham County. Originally, GCEC members were unable to obtain Internet access because the needed telecommunication services did not exist in their communities. As a result, the members formed a consortium and built their own wide-area, wireless, and fiber-optic network. The WAN now connects 18 schools, one library, and the University of Arizona's Agricultural Experiment Station to each other and to the Internet. The schools have also teamed up with Eastern Arizona College and now use the WAN to offer distance-learning classes to the students and adults in their communities.
SC	Dillon Teams Dillon 1 and Dillon 3 Consortium	Dillon Teams, a cooperative, innovative technology project between Dillon School District One and Dillon School District Three, will use technology and Internet-based resources to increase and enhance instructional environments for students. Teachers and staff will use online classes to learn about best practices of teaching and more advanced ways to incorporate technology into the classroom. Students and parents, though the districts' current laptop checkout programs, will be able to access school and Internet-based resources through local dial-up access. Dillon Teams use technology to increase accessibility and enhance instruction for all members of the community, including students, parents, staff, teachers, and administration.
TX	SUPERNET Consortium Hawkins Intermediate School District	The SUPERNET consortium, a 17-district collaborative, will establish a virtual high school to include AP, dual credit, and credit recovery for students in rural districts.

8) Data Management and Informed Decision-Making. Use technology to collect, manage, and analyze data to inform and enhance teaching and school improvement efforts.

State	Project Title and Location	Project Description
MA	Classroom Performance/School Performance: Insight into Advancing Teaching, Assessment and Learning with Technology Fitchburg Public Schools	The CP/SP project will focus on technology professional development and the use of technology for assessment, data collection, and analysis of impact on student achievement. The technology professional development program will have specific interwoven components that will address the needs of support staff, classroom teachers, and school-based and district-level administrators. The assessment/data analysis component will create a district-wide assessment, reporting, and analysis program designed to inform instructional decision-making. This program will also support building-level and district administrators, curriculum coordinators, and program directors in monitoring the status of individual student learning, cohorts of students' progress, building-based performance, and the efficacy of district-level curriculum initiatives.
OH	West Carrollton School District	The purpose of this grant project is to link Web-based instruction to state standards and district-developed quarterly assessments, and to use the data derived from these assessments to inform instructional practices.

9) Assessment. Implement performance measurement systems to determine the effectiveness of education technology programs funded under this subpart, particularly to determine the extent to which activities funded under this subpart are effective in integrating technology into curricula and instruction, increasing the ability of teachers to teach and enabling students to meet challenging State academic content and student academic achievement standards.

State	Project Title and Location	Project Description
KS	Technology-Rich Classrooms Various Districts	The purpose of this program is to provide evidence that technology-rich learning environments that are supported by strong, on-going professional development can produce positive changes in the classroom environment and result in improved student achievement in the areas of reading, math, and science. The program is based on the success of Missouri's eMints.
LA	Regional Teaching, Learning and Technology Centers (TLTCs)	This model establishes regional technology training centers that provide professional development for all districts in their region. TLTCs support all districts in a region by promoting strategies designed to use technology for enhanced teaching and learning while supporting existing State curriculum standards. The overarching goal is to provide best practices in instruction and assessment through the use of technology.
MD	Learning Management Systems Carroll County Public Schools – Lead LSS	The Learning Management System (LMS) partnership, a consortium of eight local school systems (LSSs), proposes to identify and pilot a learning management system that tracks and manages staff development opportunities to increase staff knowledge and skills and ultimately impact student learning. Over a two-year period, the consortium will customize two learning management systems and pilot them in participating LSSs. The LMS may house online assessments that provide immediate feedback to staff and, based on the results, recommend available higher education or other coursework to meet identified needs. The systems will also be used in a variety of other professional capacities as determined by each LSS.

Appendix B: Survey Instrument

SETDA-Metiri Group

State Director Survey – NCLB, Title II, Part D Round I

The intent of this survey of SEAs is to collect data on the implementation of the No Child Left Behind, Title II, Part D, Enhancing Education Through Technology program in the fifty states. Findings will be used to report regional and national trends.

SETDA plans to provide survey data to NCLB, Title II, Part D program evaluators commissioned by the U.S. Department of Education.

The survey has been divided into three sections.

Section I: State Background
Section II: Formula Grants
Section III: Competitive Grants

Thank you for completing the survey by **November 15, 2003**. The collection, analysis, and reporting of these results will establish SETDA as a "go to" organization for accurate, reliable data to meet the needs of the federal government, news media, and state agencies. It is through such efforts that the collective voice of state technology directors will be heard.

Section I: Background

1. General Information:

Number of LEAs in the state: _____
Number of LEAs eligible for NCLB, Title II, Part D:_____
First Name:_____
Last Name:_____
Title:_____
Agency:_____
Phone _____
Email _____
Address 1: _____
Address 2:_____
City:_____
State:_____
Zip:_____

2. What type of NCLB application was submitted by your state? (Check one):
   - O Consolidated
   - O Non-consolidated

3. Under NCLB Title II, Part D, up to 5% of a state's total NCLB allocation can be used for administrative costs or technical assistance. Of funds used for these purposes, not more than 60% may be used for administrative purposes.

   What percent of NCLB, Title II, Part D funds for Round I is used by your state for technical assistance? _____

   Describe briefly: _____
   _____
   _____

   What percent of NCLB, Title II, Part D funds for Round I is used by your state for administrative purposes? _____

   Were the administrative funds in your state consolidated with administrative funds from other federal programs?
   - O Yes
   - O No

   If yes, please comment on the efficacy of that approach:_____
   _____
   _____
   _____

4. How is your state agency ensuring that grants to LEAs are of sufficient scope to carry out the purposes of the NCLB legislation?

5. Describe the role and significance of NCLB Title II, Part D funding in the context of other federal, state, and local funding for initiatives related to education technology.

6. The NCLB, Title II, Part D program is administered through formula and competitive funding structures. How does this dual funding structure affect your state's ability to:

   Reach the program's goals:

   Allocate funds to high need populations:

   Equitably distribute program funds:

   Efficiently administer the program:

   Assess the program's impact:

   Change classroom practice:

Section II: Formula Grants

The questions in this section pertain to Formula Grants ONLY

7. Formula Grant Funds for Round 1:

Transferred OUT to other programs	Transferred IN from other programs	Funds refused or not applied for by LEAs
$	$	$

8. What is your state's release date for Round 1 formula funds (MM/DD/YY)? _____

9. How many NCLB, Title II, Part D formula grants were accepted by LEAs in your state in Round 1?_____

   If any LEAs either did not apply or did not accept formula grants, please indicate what reasons they cited (check all that apply):

   - ❑ Amount of funding was insufficient to warrant effort
   - ❑ LEA does not accept NCLB funding
   - ❑ Other - Please specify: _____

   Comments: _____
   _____

10. Indicate the range of NCLB, Title II, Part D formula grant awards to LEAs in your state for Round 1:

    Smallest Award: _____
    Largest Award: _____

11. How many LEAs received formula awards of each size below in your state in Round 1?

	LEAs Not Eligible	LEAs eligible but refused or didn't apply	LEAs with awards between $0 and $1,000	LEAs with awards between $1,000 and $5,000	LEAs with awards between $5,000 and $20,000	LEAs with awards between $20,000 and $100,000	LEAs with awards of $100,000 or more
Number of LEAs							

12. Which programs received funds **FROM** the NCLB Title II, Part D formula program in your state? (Check all that apply):

- ☐ Reading First or Other Early Literacy Programs
- ☐ Standards-based Reform
- ☐ Comprehensive School Improvement (beyond NCLB)
- ☐ NCLB - Title I
- ☐ NCLB - Title II A, Teacher & Principal Training & Recruiting
- ☐ NCLB - Title II B, Mathematics & Science Partnerships
- ☐ NCLB - Title II C, Innovation for Teacher Quality
- ☐ NCLB – Title III, LEP/Immigrant
- ☐ NCLB – Title IV A, Safe & Drug Free Schools & Communities
- ☐ NCLB – Title IV B, 21st Century Community Learning Centers
- ☐ NCLB – Title V, Parental Choice & Innovative Programs
- ☐ NCLB – Title VI A, Improving Academic Achievement
- ☐ NCLB – Title VI B, Rural Education Initiative
- ☐ IDEA (Individuals with Disabilities Education Act)
- ☐ Other, please specify: _____

Which programs transferred funds **TO** the NCLB Title II, Part D formula program in your state? (Check all that apply):

- ☐ Reading First or Other Early Literacy Programs
- ☐ Standards-based Reform
- ☐ Comprehensive School Improvement (beyond NCLB)
- ☐ NCLB - Title II A, Teacher & Principal Training & Recruiting
- ☐ NCLB - Title II B, Mathematics & Science Partnerships
- ☐ NCLB - Title II C, Innovation for Teacher Quality
- ☐ NCLB – Title III, LEP/Immigrant
- ☐ NCLB – Title IV A, Safe & Drug Free Schools & Communities
- ☐ NCLB – Title IV B, 21st Century Community Learning Centers
- ☐ NCLB – Title V, Parental Choice & Innovative Programs
- ☐ NCLB – Title VI A, Improving Academic Achievement
- ☐ NCLB – Title VI B, Rural Education Initiative
- ☐ IDEA (Individuals with Disabilities Education Act)
- ☐ Other, please specify: _____

13. What percentage of LEA NCLB, Title II, Part D formula grant recipients:

Applied for a waiver of the 25% professional development requirement? _____

Received a waiver of the 25% professional development requirement? _____

14. How do NCLB, Title II, Part D formula grant recipients in Round 1 expect to use their funds (as indicated in their applications)? (Check all that apply)

- ❑ **Professional Development.** Professional development that provides school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.
- ❑ **Increase Access.** Establish or expand initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local educational agencies.
- ❑ **Increase Achievement and Technology Literacy.** Adapt or expand existing and new applications of technology to enable teachers to increase student academic achievement, including technology literacy
- ❑ **Proven Learning and Technology Solutions.** Acquire proven and effective courses and curricula that include integrated technology and are designed to help students meet challenging State academic content and student academic achievement standards.
- ❑ **Foster outreach and communications with parents.** Utilize technology to develop or expand efforts to connect schools and teachers with parents and students to promote meaningful parental involvement; to foster increased communication about curricula, assignments, and assessments between students, parents, and teachers; and to assist parents in understanding the technology being applied in their child's education, so that they are able to reinforce at home the instruction their child receives at school.
- ❑ **Develop experts.** Prepare one or more teachers in elementary and secondary schools as technology leaders with the means to serve as experts and train other teachers in the effective use of technology, providing bonus payments to these technology leaders.
- ❑ **Technology.** Acquire, adapt, expand, implement, repair, and maintain existing and new applications of technology to support the school reform effort and to improve student academic achievement, including technology literacy.
- ❑ **Networking and Infrastructure.** Acquire connectivity linkages, resources, and services (including hardware, software, and other electronically delivered learning materials) for use by teachers, students, academic counselors, and school library media personnel in the classroom, in academic and college counseling centers, or in school library media centers in order to improve student academic achievement.
- ❑ **Data Management/Informed Decision-making.** Use technology to collect, manage, and analyze data to inform and enhance teaching and school improvement efforts.
- ❑ **Assessment.** Implement performance measurement systems to determine the effectiveness of education technology programs funded under this subpart, particularly to determine the extent to which activities funded under this subpart are effective in integrating technology into curricula and instruction, increasing the ability of teachers to teach and enabling students to meet challenging State academic content and student academic achievement standards.
- ❑ **Information Technology Courses.** Develop, enhance, or implement information technology courses.
- ❑ **Other.** Please specify. _____

15. The recipient activities below are those that you checked on the previous page. Rank the top 5, with 1 being the most frequent, by placing a 1, 2, 3, 4 or 5 in the box to the right of the strategies that represent the most frequently pursued activities across the projects in your state.

[Strategy] _____
[Strategy] _____
[Strategy] _____
[Strategy] _____
[Strategy] _____

16. **Program Evaluation:** The state supports rigorous evaluations of the NCLB, Title II, Part D formula grant funds as follows (check all that apply):

- ☐ The state's AYP (Adequate Yearly Progress) is the only benchmark for the effectiveness of the NCLB Title II, Part D formula grant program. No other evaluation is required.
- ☐ The state requires each LEA receiving formula grant funds to conduct a program evaluation.
- ☐ The state requires each LEA receiving formula grant funds to report results based on improvements as compared to baseline data.
- ☐ The state requires districts with formula grants to allocate at least 7% of their budgets to evaluation.
- ☐ The state provides training on program evaluation for LEAs with formula grants.
- ☐ The state provides guidelines for evaluators of LEA formula grants.
- ☐ The state facilitates exchanges and communication among evaluators for formula grants.
- ☐ None of the above.

17. This is the first year of a multi-year federal program. From your vantage point as a state technology director, please identify and discuss issues of concern related to the effective implementation of the NCLB, Title II, Part D formula grant program.

_____
_____
_____

Section III: Competitive Grants

Questions in this section pertain to Competitive Grants ONLY.

18. Competitive Grant Funds for Round 1:

Total Funds Awarded to LEAs or Consortia in Competitive Grants	Carryover From Round 1
$	$

19. What is your state's release date for Round 1 competitive funds? _____

20. By law, eligibility for an LEA or consortia for competitive NCLB, Title II, Part D funds requires inclusion of a "high need" LEA. Indicate how your state defined such eligibility:

_____
_____
_____

21. Indicate the Round 1 competitive awards your state granted to consortia. For urban/rural definitions, we assume that urban schools are those in the NCES Location Categories 1 and 2 (Large and medium sized cities that are the central city of a Metropolitan Statistical Area/CMSA), and rural schools are in NCES Location Categories 7 and 8(rural, either inside or outside a Metropolitan Statistical Area/CMSA). If you use different definitions of urban and rural, please explain in the box below:

Total Number of Consortia Grants:_____
Number Involving Rural LEAs:_____
Number Involving Urban LEAs:_____
Number Involving Institutions of Higher Education:_____
Number Involving Private Sector Partners:_____
Number Involving Non-Profit Partners:_____

Indicate the Round 1 competitive awards your state granted to LEAs:

Total Number of LEA Grants:_____
Number Involving Rural LEAs:_____
Number Involving Urban LEAs:_____

Definitions used of urban/rural:

22. Were consortia applications encouraged by your state?

- O Yes
- O No

If yes, indicate how consortia were encouraged (check all that apply):

- ❑ Limiting awards to consortia only
- ❑ Extra points awarded to consortia in scoring process
- ❑ Prior to submission date, disseminating information to potential members of consortia
- ❑ Prior to submission date, facilitating informational meetings to which potential consortia members were invited
- ❑ Prior to submission date, linking potential partners through referrals or introductions
- ❑ Other, please specify _____

23. What percent of LEA NCLB, Title II, Part D competitive grant recipients:

Applied for a waiver of the 25% professional development requirement? _____

Received a waiver of the 25% professional development requirement? _____

24. What was the period for Round 1 Competitive Awards?

- O One year
- O Two years
- O Three years

If multiple-year grants were awarded, are there contingencies for continuation?

- O Yes
- O No

Please explain:_____

_____

25. Did your state's Round 1 competitive grant process specify a focus for all competitive grants (e.g., reading, mathematics, professional development, laptop computers, infrastructure)?

- O Yes
- O No

If yes, please describe, explaining how and why:_____

_____

_____

_____

_____

_____

_____

26. How do NCLB, Title II, Part D competitive grant recipients in Round 1 expect to use their funds (as indicated in their applications)? (Check all that apply)

- ❑ **Professional Development.** Professional development that provides school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.
- ❑ **Increase Access.** Establish or expand initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local educational agencies.
- ❑ **Increase Achievement and Technology Literacy.** Adapt or expand existing and new applications of technology to enable teachers to increase student academic achievement, including technology literacy
- ❑ **Proven Learning and Technology Solutions.** Acquire proven and effective courses and curricula that include integrated technology and are designed to help students meet challenging State academic content and student academic achievement standards.
- ❑ **Foster outreach and communications with parents.** Utilize technology to develop or expand efforts to connect schools and teachers with parents and students to promote meaningful parental involvement; to foster increased communication about curricula, assignments, and assessments between students, parents, and teachers; and to assist parents in understanding the technology being applied in their child's education, so that they are able to reinforce at home the instruction their child receives at school.
- ❑ **Develop experts.** Prepare one or more teachers in elementary and secondary schools as technology leaders with the means to serve as experts and train other teachers in the effective use of technology, providing bonus payments to these technology leaders.
- ❑ **Technology.** Acquire, adapt, expand, implement, repair, and maintain existing and new applications of technology to support the school reform effort and to improve student academic achievement, including technology literacy.
- ❑ **Networking and Infrastructure.** Acquire connectivity linkages, resources, and services (including hardware, software, and other electronically delivered learning materials) for use by teachers, students, academic counselors, and school library media personnel in the classroom, in academic and college counseling centers, or in school library media centers in order to improve student academic achievement.
- ❑ **Data Management/Informed Decision-making.** Use technology to collect, manage, and analyze data to inform and enhance teaching and school improvement efforts.
- ❑ **Assessment.** Implement performance measurement systems to determine the effectiveness of education technology programs funded under this subpart, particularly to determine the extent to which activities funded under this subpart are effective in integrating technology into curricula and instruction, increasing the ability of teachers to teach and enabling students to meet challenging State academic content and student academic achievement standards.
- ❑ **Information Technology Courses.** Develop, enhance, or implement information technology courses.
- ❑ **Other.** Please specify. _____

27. The recipient activities below are those that you checked on the previous page. Rank the top 5, with 1 being the most frequent, by placing a 1, 2, 3, 4 or 5 in the box to the right of the strategies that represent the most frequently pursued activities across the projects in your state.

[Strategy] _____
[Strategy] _____
[Strategy] _____
[Strategy] _____
[Strategy] _____

28. In your opinion, what are the three most promising competitive grant programs funded in Round 1?

Program Title, LEA (or consortium), Contact Information	Description	Why do you consider this to be promising?	Strategies Involved (choose two)
			[Dropdown list of strategies] **[Dropdown list of strategies]**
			[Dropdown list of strategies] **[Dropdown list of strategies]**
			[Dropdown list of strategies] **[Dropdown list of strategies]**

29. Do you anticipate redesigning your competitive process in Year 2 or 3?

- O Yes
- O No

If yes, what is planned? When? Why?_____

30. What framework or standards were used to guide the development of the RFP for competitive grants? (Check all that apply)

- ❑ ISTE NETS for Students
- ❑ ISTE NETS for Teachers
- ❑ ISTE NETS for Administrators
- ❑ EnGauge Six Essential Conditions
- ❑ EnGauge 21st Century Skills
- ❑ CEO Forum StarChart
- ❑ CEO Forum 21st Century Learning
- ❑ Seven Dimensions
- ❑ Other state's framework (specify below)
- ❑ State standards (specify below)
- ❑ State legislation (specify below)
- ❑ State framework (specify below)
- ❑ SETDA resource (specify below)
- ❑ Other (specify below)

Please provide details for OTHER items checked above: _____

31. Is your state's NCLB, Title II, Part D competitive grant program designed to leverage funds from other sources through coordination and/or collaboration?

- O Yes
- O No

If yes, please describe: _____

32. Indicate the level of coordination and collaboration between other federal or state programs and the NCLB competitive NCLB, Title II, Part D program. (Select one circle per row):

	Minimal coordination & collaboration	←			Full integration →
	Information exchanges through standard channels only	Information exchanges through formal, regularly scheduled meetings	Formal participation in planning and management meetings between programs	Planning, trainings, and recommended resource lists are developed jointly; components are at times hosted jointly	Components of NCLB, Title II, Part D and other program are fully integrated
Reading First/ Early Literacy	○	○	○	○	○
Standards-based Reform	○	○	○	○	○
Comprehensive School Improvement (beyond NCLB)	○	○	○	○	○
Title I	○	○	○	○	○
NCLB - Title II A Teacher & Principal Training & Recruiting	○	○	○	○	○
NCLB - Title II B Mathematics & Science Partnerships	○	○	○	○	○
NCLB - Title II C Innovation for Teacher Quality	○	○	○	○	○
NCLB – Title III LEP/Immigrant	○	○	○	○	○
NCLB – Title IV A Safe and Drug Free Schools & Communities	○	○	○	○	○
NCLB – Title IV B 21st Century Community Learning Centers	○	○	○	○	○
NCLB – Title V Parental Choice & Innovative Programs	○	○	○	○	○
NCLB – Title VI A Improving Academic Achievement	○	○	○	○	○
NCLB – Title VI B Rural Education Initiative	○	○	○	○	○
IDEA (Individuals with Disabilities Education Act)	○	○	○	○	○
E-rate	○	○	○	○	○
Other (please specify below)	○	○	○	○	○

If you selected OTHER, please specify: _____
_____
_____
_____

33. This state's guidelines for NCLB, Title II, Part D competitive grants require teacher professional development to align to (check all that apply):

- ❑ The ISTE NETS standards for teachers.
- ❑ The state's teaching standards, which include technology-related competencies.
- ❑ State-adopted technology standards for teachers.
- ❑ Other (please specify):_____
- ❑ None of the above.

34. This state's guidelines for NCLB, Title II, Part D competitive grants require administrator professional development to align to (check all that apply):

- ❑ Professional development does not target administrators
- ❑ ISTE NETS for administrators.
- ❑ The state's standards for school administrators, which include technology-related competencies.
- ❑ State-adopted technology standards for administrators.
- ❑ Other (please specify):_____

35. Within the competitive portion of NCLB Title II, Part D, how are professional development programs held to a set of evidence-based criteria for effective professional development (e.g., grounded in research; linked to student learning; job-embedded or related to educators' classroom practice and continuous improvement; linked to standards; provide multiple opportunities for practice and reflection)? Check each strategy used to encourage evidenced-based approaches in professional development programs using Title II, Part D competitive funds:

- ❑ Applicants were provided with guidelines for characteristics of effective professional development.
- ❑ RFP's included guidelines and directives about acceptable types of evidence-based professional development.
- ❑ Quality of the professional development proposed was evaluated in the scoring process according to evidence-based principals.
- ❑ Applicants were required to provide professional development approaches and methods that were aligned to standards for effective professional development.

36. Does the state provide subsidized or low-cost, high-speed networking services for LEAs that are involved in the competitive grant program? (Choose ONE best answer):

- O Yes, the state provides low-cost, high-speed access for all public districts/schools with no special subsidies for high-need LEAs.
- O Yes, the state's cost-sharing formulas for participating in the network are advantageous to districts with high-risk, high-need populations, such as those funded through NCLB, Title II, Part D.
- O Yes, the state fully funds network support for districts with high-risk, high-need populations, such as those funded through NCLB, Title II, Part D.
- O No, state subsidies are not formally in place.
- O None of the above.

Comments:

_____
_____
_____
_____
_____

37. Is there a common system in the state for reporting or disseminating school data?

- O Yes
- O No

If yes, does the system (check all that apply):

- ❑ Support easy access to data on student achievement?
- ❑ Enable districts to learn from "districts like them" that are achieving student gains in areas related to the NCLB, Title II, Part D goals?
- ❑ Provide professional development about using data to drive better instructional decisions?
- ❑ Include data about school technology efforts?
- ❑ Include data about educator and student technology proficiency?

38. **Program Evaluation Studies**: The state supports rigorous evaluations of the NCLB, Title II, Part D competitive grant funds as follows (check all that apply):

- ❑ The state's AYP (Adequate Yearly Progress) is the only benchmark for the effectiveness of the NCLB Title II, Part D competitive grant program. No other evaluation is required.
- ❑ The state requires each LEA receiving competitive grant funds to conduct a program evaluation.
- ❑ The state requires each LEA receiving competitive grant funds to report results based on improvements as compared to baseline data.
- ❑ The state requires districts with competitive grants to allocate at least 7% of their budgets to evaluation.
- ❑ The state provides training on program evaluation for LEAs with competitive grants.
- ❑ The state provides guidelines for evaluators of LEA competitive grants.
- ❑ The state facilitates exchanges and communication among evaluators for competitive grants.

39. Does the state analyze comparative evaluative data from schools with NCLB, Title II, Part D competitive funds to track what technology-related educational interventions appear to be working?

- O Yes
- O No

If yes, please describe the analysis process:

_____
_____
_____
_____

If yes, how are findings disseminated to LEAs?_____
_____
_____
_____

40. Does the state anticipate that some recipients of NCLB, Title II, Part D competitive funds will conduct experimental or quasi-experimental impact studies related to NCLB, Title II, Part D goals?

O Yes
O No

If yes, describe any pre-publication review processes that the state has established:

_____
_____

41. What sources is the state using to provide a knowledge/research base to guide the use of NCLB, Title II, Part D competitive grant funds? (Check all that apply and add any additional items in the box below):

❑ ISTE Caret site
❑ National "What Works" Clearinghouse database
❑ Regional Educational Laboratories
❑ Regional Technology Education Centers
❑ Journal (please specify below)
❑ Other (please specify below)

Comments and details from items above: _____
_____
_____
_____
_____
_____
_____

42. Does the state conduct an evaluation of NCLB, Title II, Part D competitive grants at the state level?

O Yes
O No

If yes, what is the source of funds for this evaluation?

_____

How will the evaluator work with local grant evaluators?

_____

43. This is the first year of a multi-year federal program. From your vantage point as a state technology director, please identify and discuss issues of concern related to the effective implementation of the NCLB, Title II, Part D competitive grant program.

44. The NCLB, Title II, Part D primary goal is the use of technology to improve student achievement. How will the state measure the impact of its competitive grant program in achieving this goal?

Thank You

A Meta-Analysis of the Effectivenesss of Teaching and Learning With Technology on Student Outcomes

December 2003

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Learning Point Associates was founded as the North Central Regional Educational Laboratory (NCREL) in 1984. NCREL continues its research and development work as a wholly owned subsidiary of Learning Point Associates.

Contents

Abstract

To estimate the effects of teaching and learning with technology on students' cognitive, affective, and behavioral outcomes of learning, 282 effect sizes were calculated using statistical data from 42 studies that contained a combined sample of approximately 7,000 students. The mean of the study-weighted effect sizes averaging across all outcomes was .410 ($p < .001$), with a 95-percent confidence interval (CI) of .175 to .644. This result indicates that teaching and learning with technology has a small, positive, significant ($p < .001$) effect on student outcomes when compared to traditional instruction. The mean study-weighted effect size for the 29 studies containing cognitive outcomes was .448, and the mean study-weighted effect size for the 10 comparisons that focused on student affective outcomes was .464. On the other hand, the mean study-weighted effect size for the 3 studies that contained behavioral outcomes was -.091, indicating that technology had a small, negative effect on students' behavioral outcomes. The overall study-weighted effects were constant across the categories of study characteristics, quality of study indicators, technology characteristics, and instructional/teaching characteristics.

Introduction

Education often has been characterized as the only field where personal experience and ideology are relied on to make policy choices because the research base is inadequate and rarely used (National Research Council, 1999). The federal No Child Left Behind Act of 2001, however, is placing a new emphasis on scientifically based research and is requiring states and school districts to choose "evidence-based" programs for their schools and classrooms. This change is providing support to the growing numbers of researchers (Glass, 2000) and organizations, such as the Campbell Collaboration (2002), which use the statistical technique of meta-analysis to synthesize findings from research. It is argued that these systematic reviews of the research will firm up the "soft science" of education and finally begin to provide empirical evidence that certain programs or approaches are effective in improving student outcomes (Viadero, 2002).

During the past three decades, a large number of meta-analyses have systematically examined the effects of technology on student outcomes. Several meta-analyses, for example, have investigated the impact of computer-assisted instruction on student outcomes (Lipsey & Wilson, 1993). Other meta-analyses have examined aspects such as the effects of microcomputer applications in elementary schools (Ryan, 1991) and the effects of computer programming on student outcomes (Liao & Bright, 1991). Niemiec and Walberg (1992) summarized the findings on 13 quantitative research syntheses that were conducted between 1975 and 1987 and found that the average effect size was .42, which indicated that the average student who received computer-based instruction scored at the 66th percentile of the control group distribution (i.e., the 50th percentile).

Overall, these meta-analyses—along with some recent, major studies and narrative reviews of the research—have documented the positive effects of educational technology on student achievement (Schacter, 2001; Sivin-Kachala, 1998; Wenglinsky, 1998). These studies, reviews, and meta-analyses, however, typically look at different aspects or types of technology. Furthermore, this knowledge base has not really provided information on how to appropriately integrate and use technology in schools and classrooms. In addition, recent improvements regarding the quality and quantity of technology in schools suggest that technology in schools today is dramatically different from the technology that used in schools several years ago. This rapid growth and improvement in technology exceeds current knowledge of how to effectively use technology in schools (Allen, 2001) and suggests that the impact of technology is different today than it was in the past.

Although many of the meta-analyses examining the effects of technology on student outcomes were conducted more than a decade ago, several recent meta-analyses have focused on specific aspects of technology. Blok, Oostdam, Otter, and Overmaat (2002), for example, examined the effectiveness of computer-assisted instruction (CAI) programs in supporting beginning readers. Their review included 42 studies from 1990 onward, and they found the corrected overall effect size estimate was .19. Their findings were similar to earlier meta-analyses by Kulik and Kulik (1991) and Ouyang (1993), which also examined the effects of CAI and found it to have positive but small effects.

Lou, Abrami, and d'Apollonia (2001) examined the effects of students working in a small group versus working individually when students were using computer technology. They found that small-group learning had more positive effects than individual learning. Other recent meta-analyses in technology have examined topics such as the effectiveness of interactive distance education (Cavanaugh, 2001), computer-assisted instruction in science education (Bayraktar, 2001-2002), and computer-based instructional simulation (Lee, 1999). Furthermore, other recent meta-analyses have examined the effects of computer-assisted instruction on student achievement in differing science and demographic areas (Christmann & Badgett, 1999), microcomputer-based computer-assisted instruction within differing subject areas (Christmann, Badgett, & Lucking, 1997), gender differences in computer-related attitudes and behavior (Whitley, 1997), and the effectiveness of computer-assisted instruction on the academic achievement of secondary students (Christmann, Lucking, & Badgett, 1997). Some recent meta-analyses that have not yet been published have focused on the uses of educational technology in home and school (Penuel et al., 2002) and discrete educational software (Murphy, Penuel, Means, Korbak, Whaley, & Allen, 2002).

Table 1 presents a summary of nine recent meta-analyses in the area of educational technology that have been published in peer-reviewed journals. The median effect size of the seven reported effect sizes is .21, which represents a small positive effect with the experimental group scoring at the 58th percentile of the control group distribution. These meta-analyses, however, also found that their particular treatments had several differential effects on their outcomes. Lee (1999), for example, found that although computer-based simulation had a modest, positive effect size of .41 on student achievement, it had a negative effect size of -.04 on student attitudes. The ability to examine differential effects of the treatment is one of the many advantages of meta-analysis as a meaningful method to aggregate and report educational findings.

Table 1
Summary of Recent Meta-Analyses in Educational Technology

Author(s) and Date	Focus	N of Studies	Effect Size
Bayraktar (2001-2002)	CAI in secondary and college science	42	.273
Blok, Oostdam, Otter, and Overmaat (2002)	Computer-based instructional simulations	42	.190
Cavanaugh (2001)	Interactive distance education technologies	19	.147
Christmann and Badgett (1999)	CAI in science	11	.266
Christmann, Badgett, and Lucking (1997)	CAI in differing subject areas	27	.209
Christmann, Lucking, and Badgett (1997)	CAI in secondary schools	28	.172
Lee (1999)	Computer-based instructional simulation	19	.410
Lou, Abrami, and d'Apollonia (2001)	Small group versus individualized learning with technology	122	.150
Whitley (1997)	Gender differences in computer-related attitudes and behavior	82	.209
	Median =	28	.209

One area in which there have not been many meta-analyses and systematic reviews of the research is how teaching and learning with technology impacts student outcomes. This area is important because some studies have found that technology can change teachers' pedagogic practices from a teacher-centered or teacher-directed model to a more student-centered classroom where students work cooperatively, have opportunities to make choices, and play an active role in their learning. Swan and Mitrani (1993), for example, compared the classroom interactions between high school students and teachers involved in (a) computer-based instruction and (b) traditional instruction. They found that student-teacher interactions were more student-centered and individualized during computer-based teaching and learning than in

traditional teaching and learning. In another study that examined changes in classroom instruction as a result of technology, Sandholtz, Ringstaff, and Dwyer (1992) found that high access to computers enabled teachers to individualize instruction more. In a national study, Worthen, Van Dusen, and Sailor (1994) found that students using a computerized integrated learning system (ILS) in both laboratory and classroom settings were more actively engaged in learning tasks than students in the non-ILS classrooms.

Waxman and Huang (1996) similarly found that instruction in classroom settings where technology was not often used tended to be whole-class approaches, in which students generally listened or watched the teacher. Instruction in classroom settings where technology was moderately used had much less whole-class instruction and much more independent work. Another important finding from the Waxman and Huang (1996) study is that students in classrooms where technology was moderately used (more than 20 percent of the time) were found to be on task significantly more of the time than students from the other two groups—in which technology was infrequently used (less than 10 percent of the time) or in which technology was slightly used (11 percent to 19 percent of the time). These findings are similar to prior studies that found that computer-based instruction increases students' time-on-task (MacArthur, Haynes, & Malouf, 1986; Schofield & Verban, 1988; Worthen, Van Dusen, & Sailor, 1994). Although these individual studies have examined how technology impacts the teaching and learning process, little is known about how this intervention impacts student outcomes.

Purpose of the Study

Although there is an adequate knowledge base about the impact of technology on student outcomes, there are still several areas where the decision-making process is hampered due to the scant knowledge base in educational technology. One area in need of a synthesis of the research is examining the effects of teaching and learning with technology on student outcomes. The knowledge base is not consistent as to what type of classroom instruction and instructional setting is most beneficial for teaching and learning with technology in K–12 classrooms.

The purpose of the present study is to synthesize recent research on the effects of teaching and learning with technology on student outcomes. This quantitative synthesis investigates these results by addressing the following questions:

- How extensive is the empirical evidence on the relationship between teaching and learning with technology and student outcomes?
- What is the magnitude and direction of the relationship between teaching and learning with technology and student outcomes?
- Are there certain social contexts or student characteristics that affect the relationship?
- Are there particular methodological characteristics that affect the relationship?
- Are there specific characteristics of the technology that affect its relationship with student outcomes?
- Are there specific characteristics of instructional features that affect technology's relationship with student outcomes?

To answer these questions, this study quantitatively synthesized experimental and quasi-experimental published research on the effects of teaching and learning with technology on student outcomes in naturalistic settings. The techniques of research synthesis that were applied derive from the work of Glass, McGaw, and Smith (1981) and Hunter, Schmidt, and Jackson (1982) on meta-analysis, as well as contributions from Arthur, Bennett, and Huffcutt (2001), Durlak (1995), and Lipsey and Wilson (2001).

Method

Search and Selection Criteria

A systematic search of research published from 1997 through 2003 investigating the effects of technology on student outcomes was conducted by accessing several sources. For this review, we used selection criteria and review methods that are similar to other recent major national reviews conducted in areas such as teacher preparation (Wilson, Floden, & Ferrini-Mundy, 2001) and reading (National Reading Panel, 2001).

Several criteria were established for inclusion in this synthesis. The synthesis included quantitative, experimental, and quasi-experimental research and evaluation studies that have been published in refereed journals during a six-year period (1997–2003). In order to be included, the study also needed to: (a) focus on teaching and learning with technology in K–12 classroom contexts where students and their teachers interact primarily face-to-face (> 50 percent of the time); (b) compare a technology group to a nontechnology comparison group, or compare the group at the beginning of the intervention (pretest) to a posttest measure; and (c) have reported statistical data (e.g., *t* tests or *F* tests) that allowed the calculation of effect sizes.

We identified studies by examining database searches, using relevant keywords, and searching the Education Resources Information Center (ERIC). We located additional studies by examining the reference lists of relevant literature reviews and reports. We specifically examined several major journals in the field of educational technology, such as:

British Journal of Educational Technology
Canadian Journal of Educational Communication
Canadian Journal of Learning and Technology
Computer Science Education
Computers & Education
Computers and Education: An International Journal
Computers in Human Behavior
Computers in the Schools
Education and Information Technologies
Educational Media International
Educational Technology
European Journal of Education
Human Computer Interaction
Instructional Science
Interactive Learning Environments
International Journal of Computers for Mathematical Learning
International Journal of Instructional Media
Journal of Computers in Math and Science Teaching
Journal of Education Technology Systems
Journal of Educational Computing Research
Journal of Educational Media
Journal of Educational Technology Research and Development
Journal of Technology Education

Journal of Technology Studies
Learning and Leading With Technology

In addition, other education journals such as *American Educational Research Journal, Journal of Educational Research, British Journal of Educational Psychology, Journal of Education for Teaching, Educational Psychology, Educational Psychologist, Journal of Educational Psychology, Contemporary Educational Psychology, Teaching and Teacher Education, Learning and Instruction, Research in Education, and Elementary School Journal* were examined. Also, several Web sites provided comprehensive lists of technology-based journals with links to journal Web sites. Some were links to specific journals, and others that were only print-based provided a fairly comprehensive index to their journals. Entering the keywords *educational technology*, *evaluation*, and *instruction and research* into a search engine (e.g., Metacrawler and Google) provided a number of other sites (e.g., **dmoz.org**) that were searched.

Certain types of studies and reports were excluded from the synthesis. Many studies were eliminated because they did not report the appropriate statistics necessary to calculate effect sizes. Some of these studies, for example, provided raw scores for a few "select" participants in the treatment group, but they did not report aggregate scores for both groups (i.e., experimental and control groups). Other studies were eliminated because students in the control group either had access to or used computers. There were many studies, for example, that used research designs where technology was held as a constant and comparisons were made between factors such as differential feedback or instructional approaches. Most of these studies, however, were eliminated because all the students in the control groups had access to and used technology. The search and selection procedures resulted in a collection of 40 studies. Of these, 35 are published articles from technology journals, and five are published articles from education journals.

Procedure

To calibrate the studies' results, or place them on a common scale, effect sizes were calculated. These effect sizes consist of the treatment group mean minus the control mean divided by the control standard deviation. Effect sizes can be considered a standardized estimate of where the treatment group stands in comparison with the control group distribution. In the case of articles examined for this study, a positive effect size indicated that the instructional technology group received higher (i.e., more desirable) scores than the control group. The formulas of Glass, McGaw, and Smith (1981) were employed for studies that did not report group means or standard deviations but contained F or t values, correlations, or other statistics from which effect sizes could be calculated.

For this synthesis, three investigators recorded 69 codable characteristics and other data for each of the 282 effect sizes from the 42 studies. The 69 categorical variables were employed as factors in an analysis of variance (ANOVA). Each investigator independently coded three studies from each of two investigators. The intercoder agreement for each study reviewed exceeded the 85-percent criterion.

The coding categories are listed in the Appendix. The methodological threats to validity were adapted from Cook and Campbell (1979). Most of the technology characteristics were adapted from other meta-analyses in the area. The teaching variables were adapted from the Five Standards for Effective Pedagogy developed by the Center for Research on Education, Diversity, and Excellence (2002; see Dalton, 1998; Tharp, 1997). The five standards are: (1) Teachers and Students Producing Together (Joint Productive Activity), (2) Developing Language and Literacy Across the Curriculum (Language Development), (3) Making Meaning: Connecting School to Students' Lives (Contextualization), (4) Teaching Complex Thinking (Challenging Activities), and (5) Teaching Through Conversation (Instructional Conversation). These standards are based on the best theoretical and empirical knowledge in the field, and there is ample evidence that their use in classrooms may lead to dramatic improvements for the education of all students (Tharp, Estrada, Dalton, & Yamauchi, 2000).

The studies varied by the number of comparisons they reported. Therefore, those studies with a greater number of comparisons (e.g., those that reported separate results by ability level, sex, or race) would have weighted more heavily than others if each comparison had been given equal weight. To give all studies the same unit weight in the analysis, each comparison was weighted in inverse proportion to the number of comparisons in the study from which it was taken (i.e., $1/n$ where n = number of comparisons in the study). Each of the three comparisons of Michael (2001), for example, received a weight of .333. For studies in which multiple comparisons were made by the percentages of computer use or number of computers, the comparisons between the high and low categories were used to calculate the effect size. Most of the studies had multiple outcomes, but the only comparisons included were those that had the appropriate statistics to calculate effect sizes.

Results

The results comprise two sections. The first section summarizes the quantity, type, and quality of studies included in the review. The second section summarizes the overall findings from the studies.

Description of Studies in Review

Initially, a total of nearly 200 potentially applicable articles were retrieved. Upon further application of the criteria for the synthesis, however, only 42 articles were included in the final synthesis. Many of the articles were eliminated because they did not provide the relevant statistics for calculating effect sizes. Other studies were eliminated because students in the control groups had access to or used technology. The final sample of studies included 42 journal articles. A total of 282 effect sizes were calculated from the 42 studies. The studies contained a combined sample of about 7,000 students. The mean number of students in the sample of studies was 184, and the range was from 32 to 2,802. About half of the studies had sample sizes of less than 50, and only 25 percent of the studies had sample sizes greater than 100.
About 20 percent of the studies were published in 2001, 15 percent in 1999, 14 percent in 2000, and 12 percent for 2002 and 2003. The average number of comparisons in each study was approximately 7, but the range was from 1 to 27. About 40 percent of the studies focused on elementary school (Grades K–5), 40 percent on middle-level school (Grades 6–8), and 20 percent on secondary school (Grades 9–12). In terms of research design, about 67 percent of the studies included in the synthesis were quasi-experimental, using either a nonrandomized static-group posttest comparison design (19 percent), a nonrandomized one-group pretest-posttest design (21 percent), or a nonrandomized pretest-posttest control group design (25 percent). Only 25 percent of the studies used an experimental (randomized) pretest-posttest control group design or a randomized posttest-only control group design.

In terms of type of technology, 30 percent of the studies used personal computers, 26 percent used networked laboratories, 5 percent used multimedia, and the other 39 percent used a variety of other technology resources. In terms of instructional software, 31 percent of the studies used an exploratory environment such as simulations, hypermedia, and hypertext. About 10 percent used drill-and-practice software, 7 percent used tools for other tasks such as word processing or e-mail, and 32 percent used mixed forms of technology. About 20 percent of the studies did not specify the software they used.

Evidence for the use of Five Standards for Effective Pedagogy was not very prevalent in the studies reviewed. In 71 percent of the studies, for example, there was no evidence that instructional conversations (extended dialogue between teachers and students) occurred in the classroom. In more than half of the studies, the use of language and literacy activities, contextualization/making meaning, and challenging activities was not described. The one standard that was somewhat prevalent was joint productive activities. There was some evidence that it was prevalent in 34 percent of the studies, and there was extensive evidence that it was prevalent in 21 percent of the studies.

The cognitive outcomes used in the 42 studies varied widely. The most common cognitive outcomes were a researcher-based test (38 percent), followed by authentic assessments (14 percent), and then standardized tests (10 percent). About 57 percent of the affective outcomes were student attitudes towards computers, and 18 percent were students' motivation or self-concept. About 83 percent of the behavioral outcomes examined in the studies in this synthesis focused on the number of tasks attempted, followed by student time-on-task (18 percent), and student perseverance (5 percent).

Overall Results

Table 2a and Table 2b list the mean study-weighted means and the unweighted means for each of the three outcomes and the overall mean. The standard deviations, confidence intervals, and number of comparisons also are included in Table 2a and Table 2b. The mean of the study-weighted effect sizes averaging across all outcomes was .410 ($p < .001$), with a 95-percent confidence interval of .175 to .644. This result indicates that teaching and learning with technology has a small, positive, significant ($p < .001$) effect on student outcomes when compared to traditional instruction.

Table 2a
Summary of Mean Study-Weighted Effect Sizes for Student Outcomes

Outcomes	Number of Weighted Comparisons	Study-Weighted Effect Sizes	SD	95% Confidence Intervals Lower	Higher
Cognitive	29	.448	.720	.171	.724
Affective	10	.464	.872	-.166	1.094
Behavioral	3	-.091	.623	-.142	1.243
Overall	**42**	**.410**	**.748**	**.175**	**.644**

Table 2b
Summary of Unweighted Effect Sizes for Student Outcomes

Outcomes	Number of Unweighted Comparisons	Unweighted Effect Sizes	SD	95% Confidence Intervals Lower	Higher
Cognitive	167	.544	.792	.423	.665
Affective	79	.290	.543	.168	.411
Behavioral	36	.087	.349	-.031	.205
Overall	**282**	**.414**	**.704**	**.332**	**.497**

In addition to examining the overall mean study-weighted effect size, we also examined the effect sizes for each of the three types of outcomes. The mean study-weighted effect size for the 29 study-weighted comparisons containing cognitive outcomes was .448, ($p < .01$), with a 95-percent confidence interval of .171 to .724. This result indicates that teaching and learning with technology has a small, positive effect on students' cognitive outcomes when compared to traditional instruction. The mean study-weighted effect size for the 10 study-weighted comparisons that focused on student affective outcomes was .464. ($p > .05$), with a 95-percent confidence interval of -.166 to 1.094. This result indicates that teaching and learning with technology has a small, positive, non-significant ($p > .05$) effect on students' affective outcomes when compared to traditional instruction. Finally, the mean study-weighted effect size for the three study-weighted comparisons that contained behavioral outcomes was -.091, ($p > .05$), with a 95-percent confidence interval of -.142 to 1.243, indicating that technology had a slight, negative, nonsignificant effect on students' behavioral outcomes.

The unweighted effect sizes are similar to the study-weighted results. Of the 282 effect sizes that were examined in the 42 studies, about 71 percent were positive. The overall, unweighted effect size was .414, ($p < .001$), with a 95-percent confidence interval of .332 to .497. The unweighted effect size was .544 for cognitive outcomes, .290 for affective outcomes, and .087 for behavioral outcomes.

The standard deviations for both the study-weighted and unweighted effect sizes are quite large, indicating a great deal of variation among the studies. The confidence intervals reported in Table 2a and Table 2b describe the precision of the estimate of the mean effect size by indicating the range within which the population mean is likely to be, given the observed data (Lipsey & Wilson, 2001).

The relationship of each of the 57 conditioning (i.e., independent) variables to the mean study-weighted effect size was tested for significance using ANOVA. The results indicate that none of the variables had a statistically significant ($p < .01$) impact on the study-weighted effect size. In other words, the overall findings suggest that the results do not differ significantly across categories of technology, instructional characteristics, methodological rigor, characteristics of the study, and subject characteristics.

Discussion

The results of this quantitative synthesis show a modest, positive effect of teaching and learning with technology on student outcomes. The mean effect size of .410 is higher than the median of other recent meta-analyses in the area of instructional technology in education (see Table 1). Furthermore, the findings from the present meta-analysis revealed no significant differences across the contextual categories of study quality, teaching, and technology characteristics. In other words, the results can be generalized across a wide variety of conditions that have been investigated as well as across student, school, and study characteristics.

Research Quality Issues

One of the most important issues related to teaching and learning with technology that needs to be addressed is the soundness of the research for the implementation and improvement of technology programs. First, there were few quantitative studies published in the last five years that included relevant data to permit a meta-analysis and calculation of effect sizes. Scientific journals that use independent peer review in deciding what research merits publication are generally considered to be the highest standard of research, yet much of the work in the field of teaching and learning with technology does not meet that standard. The lack of quality, refereed quantitative studies points to a serious problem of research in the field.

Second, there were few studies that used a randomized, experimental design. Only 25 percent of the studies included in the meta-analysis used randomized, experimental designs. Furthermore, it is somewhat surprising that there are still many recent articles published in technology journals that are merely descriptive in nature and just report anecdotes from "selected" teachers or students who enjoy using the technology application. Other published studies explicitly state that their work is "exploratory" in nature, which might explain why they do not report specific findings.

A final concern regarding the quality of research in the field pertains to the lack of details that were included in many of the published articles included in this meta-analysis. Many of the studies lacked the specificity that was needed for us (and potentially others) to code all of the teaching and technology characteristics that we were specifically interested in. About 20 percent of the studies, for example, did not even specify what software was being using in their study. Researchers and journal editors need to make sure that all the relevant details about the classroom processes (e.g., teaching and technology components) are included in articles. Without that explicit information, we will return to the past decades of research on instructional technology, where we were considered to be in a "black box" stage in which we had no idea why instructional technology was effective (Waxman & Bright, 1993).

Limitations of the Present Study

The present meta-analysis, like most others, has several limitations. First, meta-analysis findings are correlational in nature and, therefore, do not warrant strong causal inferences. Second, meta-analysts do not have experimental control over data that reduces the sensitivity of the analysis.

Third, the overall findings from the meta-analysis often are limited by the quality of the primary studies, a problem we have previously discussed.

Another perceived limitation of this meta-analysis may be that we included only published articles in refereed journals. Our justification for doing that is threefold. First, one of the critical scientific principles of educational research is that "scientific studies do not contribute to a larger body of knowledge until they are widely disseminated and subjected to professional scrutiny by peers" (National Research Council, 2002, p. 5). In recent years, a growing number of educators and researchers have become concerned about the quality of work that is posted and disseminated on the Internet. The Committee on Scientific Principles for Education Research (National Research Council, 2002), for example, maintains that the "extent to which the principles of science are met in some electronically posted work is often unclear" (p. 72). In this era of evidence-based and scientifically based research, one of the critical characteristics of a study is that it is refereed (i.e., approved for publication) by a panel of independent reviewers (International Reading Association, 2002).

A second explanation of why we excluded Web-based reports is that they often are too broad in nature yet not specific enough to allow meaningful coding. For example, we carefully examined about 20 potential sources from the major national research labs, regional support services, policy institutes, and government institutions. Some of those reports were quantitative studies and even included effect sizes; but they covered, for example, statewide programs over a 10-year intervention period. This report and others clearly do not feature the singularity and clarity of focus that one needs for inclusion in a meta-analysis.

We excluded books, chapters, dissertations, conference proceedings, and technical reports because they are unevenly reviewed. Furthermore, a final explanation of why we excluded nonpublished reports is that there is some evidence that nonpublished Web-based reports in technology have dramatically higher effect sizes than published reports (Niemiec, Sikorski, & Walberg, 1996). Also, there is evidence that many Web-based technical reports are sponsored by agencies that have obvious conflict of interests associated with the results (Wilson, Floden, & Ferrini-Mundy, 2001). For example, in a recent meta-analysis investigating the use of technology to enhance connections between home and school, Penuel et al. (2002) examined the relationship between the researchers who conducted the evaluation studies included in the meta-analysis and the programs they evaluated. They found that in more than half of the studies, the researcher was hired to do the research by either the vendor or school district involved in the study.

A final limitation of our study relates to the recentness of the review. Although we were interested in recent applications of technology, a few of the studies included in the meta-analysis stated that their article was based on projects completed in the early 1990s. In other words, even though we chose only articles that were published within the last five years, some of those articles are still based on technology (i.e., software and hardware) that is nearly a decade old. Future research syntheses may want to include either more rigorous criteria to ensure that only recent technology projects are included or expand the criteria to include older studies in order to examine if there are any secular trends.

Conclusions

The results of this meta-analysis are generally encouraging. The result from the present study indicate that the overall effects are nearly twice as large as other recent meta-analyses conducted in the area of instructional technology. This finding suggests that the overall effects of technology on student outcomes may be greater than previously thought.

Another aspect of the present study that is encouraging and that may stimulate future research lies in the comprehensive list of variables included in the meta-analysis (see Appendix). This conceptualization suggests that teaching and technology processes either may directly impact student outcomes or may interact with technology features and indirectly impact outcomes. We also believe that the coding procedures effectively captured the essential features of the original research we synthesized. The final list of variables and specific codes included in the Appendix reflects a collaborative process among researchers and practitioners that evolved over time. The high interrater agreement we obtained in coding the studies supports our claims of the viability of the process.

There are, of course, many unanswered questions about the effects of teaching and learning with technology on students' outcomes. We maintain, however, that research can play a critical role in answering some of these questions. Policymakers, however, will need to invest more money on research in technology. The findings from this research synthesis suggest that more and better research needs to be funded and conducted by researchers in this area. Although recognition of the uniqueness of each school and classroom situation will always need to be considered, the accumulation of research evidence over time and across studies may provide consistent findings that enhance our understandings of the role of teaching and learning with technology.

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Appendix

Information Coded for Each Study

Study Characteristics

Author (Report last name, first; e.g., Doe, John).

Year of Study (Report year of study; e.g., 2000).

Number of Comparisons Within Study (Report number; e.g., 1 or 2 or 3).

Student Sex (Males = 1; Females = 2; Mixed or not specified = 3).

Grade Level (Unspecified = 00; 1st grade = 01; Other grades 2–12 use 02 to 12; Mixed primary [K–3] = 24; Mixed middle [4–6] = 25; Mixed upper [7–8] = 26; Mixed high school [9–12] = 27; K–12 = 28).

Unit of Analysis (Unspecified = 0; Individual = 1; Class = 2; School = 3; District = 4; State = 5; Mixed = 6).

Student Sample Size (Report actual sample size; e.g., 4,024).

School Sample Size (Report actual sample size; e.g., 4,024).

Publication Features (Technology journal = 1; Other educational journal = 2).

Students' Ethnicity (Unspecified = 1; Black = 2; Hispanic = 3; Asian = 4; White = 5; Mixed = 6; Other = 7).

Students' Socioeconomic Status (Unspecified = 0; Lower = 1; Lower middle = 2; Middle = 3; Upper middle = 4; Upper = 5; Mixed = 6).

Country (Unspecified = 0; USA = 1; Canada = 2; Mexico/Latin America = 3; Europe = 4; Asia = 5: South America = 6; Cross-Cultural = 7; Other = 8;)

Geographical Region in USA (Northeast = 1; Southeast = 2; Midwest = 3; South Central = 4; Southwest = 5; Northwest = 6; Mixed = 7; Other = 8).

School Type (Unspecified = 0; Public = 1; Private = 2; Special school = 3; Mixed = 4; Other = 5).

Community Type (Unspecified = 0; Urban = 1; Rural = 2; Suburban = 3; Mixed = 4; Other = 5).

Content Area (Content area where technology is used. Unspecified = 0; Reading = 2; Mathematics = 3; Social studies = 4; Science = 5; Reading and math = 6; Language arts = 7; Foreign language = 8; Mixed = 9; Other = 10).

Quality of Study Indicators

Method of Observation of Independent Variable (i.e., technology use. Unspecified = 0; Systematic observation = 1; Informal observation = 2; Student survey or interview = 3; Teacher survey or interview = 3; Administrator survey or interview = 4; Computer logs = 5; Multiple methods = 6; Other = 7).

Pretest Equivalency (Has the initial differences between the two groups been accounted for? Unspecified = 0; Statistical Control (e.g., ANCOVA, regression) = 1; Random Assignment = 2; Statistical Control and Random Assignment = 3; Gain Scores = 4; Matching = 5; Other = 6).

Reported Reliability of Measures (Unspecified = 00; Actual reliability statistic (e.g., 70 or 83).

Manner in Which Outcome Scores Are Reported (Unspecified = 0; Standard scores = 1; Raw scores = 2; Percentile ranks = 3; Gain scores = 4; Other = 5).

Duration of Study (Unspecified = 00; List the number of months that the implementation of the technology occurred).

Cognitive Outcomes (Unspecified = 0; Testing company standardized achievement test = 1; Federal/national standardized test = 2; State-level achievement test = 3; District-level achievement test = 4; School-level test = 5; Grade-level test = 6; Teacher-made test = 7; Researcher-developed test = 8; Authentic assessment = 9; Creativity test = 10; Higher-level thinking test = 11; Other = 12).

Affective Outcomes (Unspecified = 0; Student attitudes toward computers, content areas, anxiety, or instruction = 1; Academic self-concept or motivation = 2; Other = 3).

Behavioral Outcomes (Unspecified = 0; Student time-on-task = 1; student perseverance = 2; Tasks attempted = 3; Tasks completed = 3; Success rate = 4; Positive peer interaction = 5; Interactivity with computers = 6; Other = 7).

Effect Size Coefficient (actual coefficient)

Statistics (Statistics used in determining effect size; Means = 1; *t*-value = 2; *F*-value = 3; Chi-square = 4; Other = 5).

Weight (One divided by the actual number of comparisons in the study, e.g., 3 comparisons = 1/3 or .333).

Sources of Invalidity

Type of Design (Quasi-experimental/nonrandomized one group pretest-posttest = 1; Nonrandomized static-group comparison = 2; Nonrandomized pre-post control group = 3; Time series = 4; Randomized posttest-only control group = 5; Randomized pre-post control group = 6; Other = 7).

History (Have specific events occurred between the first and second measurement in addition to the experimental variable? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Maturation (Are there processes within the participants operating as a function of the passage of time [e.g., growing older, more tired] that might account for changes in the dependent measure? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Testing (Is there an effect of taking a test upon the scores of a second testing? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Instrumentation (Do changes in calibration or observers' scores produce changes in the obtained measurement? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Statistical Regression (Have groups been selected on the basis of their extreme scores? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Selection Bias (Have biases resulted in the differential selection of comparison groups? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Mortality (Has there been a differential loss of participants from the experimental and control groups? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Selection-Maturation Interaction (Is there an interaction between extraneous factors such as history, maturation, or testing and the specific selection differences that distinguish the experimental and control groups? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Reactive or Interaction Effect of Testing (Does pretesting influence the participants' responsiveness to the experimental variable, making the results for a pretested population unrepresentative of the effects of the experimental variable for the unpretested universe from which the participants were selected? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Interaction of Selection Biases and Treatment (Are there selective factors upon which sampling was based which interact differentially with the experimental variable? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Reactive Effects of Experimental Arrangements (Are there effects of the experimental setting that would preclude generalizing about the effect of the experimental variable upon persons being exposed to it in nonexperimental settings? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Multiple-Treatment Interference (Are there nonerasable effects of previous treatments applied to the same participants? Adequately controlled by design = 1; Definite weakness of design = 2; Possible source of concern = 3; Not a relevant factor = 4).

Statistical Power (Is the sample size large enough to reject the null hypothesis at a given level of probability, or are the estimate coefficients within reasonably small margins of error? [a sample > 60 for groups such as classes, schools, or districts; a sample >100 for individuals]. Probable threat [< 60 for groups or < 100 for individuals as the unit of analysis] = 1; Adequately minimized [> 60 for groups; > 100 for individuals] = 2).

Technology Characteristics

Type of Technology (Unspecified = 0; PCs = 1; Laptops = 2; Networked labs = 3; HP calculators = 4; Multimedia = 5; Other = 6).

Software (Unspecified = 0; Tutorial = 1; Drill-and-practice = 2; Exploratory environment [e.g., simulations, microworlds, hypermedia, and hypertext] = 3; Tools for other tasks [e.g., word processor for writing, e-mail, or computer-conference for course assignments] = 4; Programming language = 5; Other = 6).

Technology Resources/Support Available (Unspecified = 0; No resources = 1; Minimal resources = 2; Adequate resources = 3; Ample resources = 4; Other = 5).

Role/Focus of Technology (Unspecified = 0; Productivity = 1; Delivery system [e.g., ILS] = 2; Resource [e.g., Internet] = 3; Other = 4).

Quantity of Technology (Unspecified = 0; Few [< 3 per classroom] = 1; Average [4–8 per classroom] = 2; Ample [> 9 per classroom] = 3; Other = 4).

Number of Computer Sessions (Unspecified = 0; List number of sessions [e.g., 12]).

Duration of Computer Sessions (Unspecified = 0; List number of average minutes per sessions [e.g., 40]).

Teachers' Experience with Technology (Unspecified = 0; None = 1; Minimal experience = 2; Average = 3; Experienced = 4; Very experienced = 5).

Students' Experience with Technology (Unspecified = 0; None = 1; Minimal experience = 2; Average = 3; Experienced = 4; Very experienced = 5).

Teacher Training in Technology (Unspecified = 0; List hours of training (e.g., 15).

Feedback and Assessment Practices (Unspecified = 0; No feedback = 1; Minimal feedback = 2; Elaborate feedback = 3; Other = 4).

Learning Responsibility (Unspecified = 0; Student controlled = 1; Teacher directed = 2; System directed = 3; Mixed = 4; Other = 5).

Task Difficulty (Unspecified = 0; Difficult = 1; Moderately difficult = 2; Not difficult = 3; Mixed levels of difficulty = 4; Other = 5).

Type of Learning Task (Unspecified = 0; Basic skills/factual learning = 1; Problem solving = 2; Inquiry/investigation = 3; Project-based = 4; Mixed types = 5; Other = 6).

Type of Technology Program (Unspecified = 0; Basic skills/factual learning = 1; Problem solving = 2; Inquiry = 3; Mixed types = 4; Other = 5).

Pattern of Student Computer Use (Unspecified = 0; Teacher use only = 1; Presentation station = 2; One student per computer = 3; Two students per computer = 4; 3–5 students per computer = 4; > 5 students per computer = 6; Mixed pattern = 7; Other = 8).

Percentage of Students Using Computers (Unspecified = 0; > 10% = 1; 10–25% = 2; 26–50% = 3; 51–75% = 4; 76–90% = 5; > 90% = 6).

Objectives of Computer Use (Unspecified = 0; Remediation of skills not learned = 1; Expressing themselves in writing = 2; Communicating electronically with other people = 3; Finding out about ideas and information = 4; Analyzing information = 5; Presenting information to an audience = 6; Improving computer skills = 7; Learning to work collaboratively = 8; Learning to work independently = 9; Multiple Objectives = 10; Other = 11).

Instructional/Teaching Characteristics

Joint Productive Activity/Collaboration (e.g., Designs instructional activities requiring student collaboration to accomplish a joint product; monitors and supports students collaboration in positive ways. No evidence = 1; Some evidence = 2; Extensive evidence = 3).

Language and Literacy Development (e.g., Connects student language with literacy and content-area knowledge through speaking, listening, reading, and writing activities; encourages students to use content vocabulary to express their understanding. No evidence = 1; Some evidence = 2; Extensive evidence = 3).

Contextualization/Making Meaning (e.g., Begins activities with what students already know from home, community, and school; encourages students to use content vocabulary to express their understanding. No evidence = 1; Some evidence = 2; Extensive evidence = 3).

Challenging Activities (e.g., Designs instructional tasks that advance students' understanding to more complex levels. Assures that students—for each instructional topic—see the whole picture as a basis for understanding the parts. No evidence = 1; Some evidence = 2; Extensive evidence = 3).

Instructional Conversation (e,g, Arranges the classroom to accommodate conversational between the teacher and a small group of students on a regular and frequent basis. Guides

conversation to include students' views, judgments, and rationales using text evidence and other substantive support. No evidence = 1; Some evidence = 2; Extensive evidence = 3).

Setting (Unspecified = 0; Classroom = 1; Networked lab within class = 2; Computer lab in school = 3; Other = 4).

Mode of Instruction (Unspecified = 0; Whole-group instruction = 1; Paired = 2; Small-group instruction [3–5 members] = 3; Individualized = 4; Mixed = 5; Other = 6).

Role of Teacher (Unspecified = 0; Deliverer of knowledge = 1; Facilitator of groups/student learning = 2; Modeling processes [e.g., problem solving] = 3; Mixed = 4; Other = 5).

Teacher Qualifications (Unspecified = 0; Alternatively certified or provisional certificate = 1; Certified in content area = 2; Not certified in content area = 3; Other = 4).

Policy

Level (Unspecified = 0; School = 1; District = 2; State = 3; Federal = 4; Other = 5).

Focus (Unspecified = 0; Reducing achievement gaps = 1; Increased use of technology = 2; Increased specific type of use = 3; Other = 4).

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Studies validate laptop programs in U.S., Canada

From eSchool News staff and wire service reports
March 1, 2004

Two recent studies of schoolwide one-to-one computing initiatives--one in the United States and one in Canada--suggest that using laptops in the classroom can help improve students' writing skills and bolster overall academic success. The studies come as an increasing number of states and school districts are rolling out laptop programs of their own.

In Maine, educators at the Piscataquis Community High School (PCHS) in the rural community of Guilford are touting the results of a survey released in January, demonstrating that laptops can have a significant positive impact on learning, especially for at-risk and traditionally low-achieving students. Researchers say the results might help sway lawmakers as they consider expanding to high schools the state's current laptop program for middle school students.

And in British Columbia, another one-to-one computing study finds that students who use laptop computers to complete their writing assignments can boost their English scores by an average of 30 percent. According to the report, at least 150 middle school students at the Peace River North School District in northern British Columbia showed "vast improvements" in their writing ability last year after wireless laptops were integrated into the classroom.

This year, 90 percent of students who used the machines met the province's writing standards. Before the laptop program, only 70 percent of students were able to meet the requirements, the study said.

Across the country, one-to-one computing initiatives have been gathering steam as educators and policy makers continue to explore the direct link between technology and student achievement. With this research, many now say the connection is indisputable.

"These studies are vital," said PCHS Principal Kevin Jordan. "You can listen to what other people say ... but this really validates the entire process."

The Maine study, undertaken by the independent Mitchell Institute and conducted by the Great Maine Schools Project with funding from the Bill and Melinda Gates Foundation, is among the first to examine one-to-one computing in a high school environment. The findings reflect information gleaned from the first two years of the project.

In all, 285 students in grades 9-12 and all 26 teachers were given a laptop computer to use at home and at school. Every machine was outfitted with a wireless access card to provide access to the internet from anywhere on campus.

Seventy-nine percent of the students said laptops make lessons more interesting, and 60 percent said they felt more motivated to complete assignments using a laptop.

What's more, most students agree that laptops have improved the quality of their schoolwork. According to the study, more than half (54 percent) of students say having a laptop has improved their grades, and nearly two-thirds (64 percent) of teachers agree that student achievement in their classes has improved since the laptop program began.

Jordan said teachers and students use the laptops in a variety of ways, from conducting research and creating PowerPoint presentations to completing web quests. For teachers, Jordan said, "this is just one more part of their arsenal."

According to the study, more than 70 percent of teachers reported that the laptop program has improved student interaction with teachers and has improved interaction among students, especially those traditionally defined as "at-risk" or "low-achieving." More than three-quarters of teachers said the laptops had improved their students' engagement, class participation, motivation, ability to work in groups, and ability to work independently.

Where low-achieving and at-risk students are concerned, Jordan said the laptops "seem to engage them and keep them engaged." He believes that's because the interactive nature of the technology appeals to students with very different learning styles.

"Face it, we're in a digital world now," he said. "This is just one more mode for them to utilize."

To implement its high school laptop initiative, PCHS used more than $500,000 in donations and grants to purchase iBook laptops from Apple Computer for every teacher and student at the school. Also included in the price was the cost of installing wireless internet access throughout the building.

But the process isn't quite as easy as plug-and-play. Jordan said it does take time for staff and students to become acquainted with the technology.

To prepare for the integration at PCHS, some of the school's more tech-savvy students were invited to participate in a four-day "boot camp" covering everything from performing simple repairs on laptops to loading software and computer programming, Jordan said. Those students, in turn, were asked to provide on-site technical support throughout the initial deployment, he said.

It didn't hurt that many of the students already had a leg up on the technology, he added. PCHS remains the only high school across the state to have successfully implemented a schoolwide laptop program, but it is far from being the only school.

As part of his legacy in 2002, former Gov. Angus King launched the Maine Learning Technology Initiative, the first one-to-one computing program in the country to provide laptops to every seventh and eighth grader throughout the state. Because the majority of PCHS students hailed from middle schools where laptops are now the standard, Jordan said it wasn't hard to find good

help.

"We sort of utilized the kids as experts," he said. "It was a kind of train-the-trainer model ... with the kids as facilitators."

Jordan said he hasn't seen any drawbacks to using the technology, save for the tendency of students to use instant-messaging software to exchange quick-witted virtual notes with one another. But that's nothing that "good-quality classroom management" can't fix, he said: "It's all about setting the culture of the schools as time goes on."

In British Columbia, educators also are having success with a laptop program. In February 2002, Peace River North--a school for middle-grade students, part of the province's School District 60--initiated the Wireless Writing Project, a classroom-based, one-to-one laptop program designed to spur student achievement in grades six and seven, particularly in written expression.

What they found was encouraging.

In May 2003, 92 percent of the school's students produced writing samples that met expectations on the BC Performance Standards--the student assessment metric used by the province--compared with 70 percent of students on the pretest. The project also found that teachers, parents, and students were enthusiastic about the integration of laptops and what impact the machines would have on student achievement, motivation, and attitude.

Teachers, parents, and students describe positive changes in other aspects of achievement as well, most notably technology skills and student attitudes, motivation, and work habits. Since moving to the laptops, researchers say students appear to be better organized, more responsible, and more confident.

Success stories like these might spur other states and school systems to invest in similar programs. Already, some enterprising states are following Maine's lead.

In New Mexico, for instance, Gov. Bill Richardson recently announced plans for a new statewide laptop program that officials say they modeled after the Maine program.

Called the Governor's Laptop Learning Initiative, the program reportedly will provide laptop computers to all seventh graders and their teachers. More than 700 students and 80 teachers in six schools will receive laptop computers in the first phase of the initiative, with the goal of eventually providing computers to every seventh grader in the state.

According to published reports, the cost for each laptop is $1,128, including grade- and curriculum-specific software. Dell Inc. is providing the laptops for the initiative.

In New Hampshire, the Associated Press (AP) reported that more than 400 students and 40 teachers at six middle schools recently received laptop computers as part of a $1.2 million grant initiative. According to AP, the schools also received projectors, printers, digital cameras, a server, and a wireless network connecting the laptops to each other and to the internet.

Officials say their program, too, was inspired by the one in Maine.

One hope is that the machines eventually could replace textbooks, said Betsey Cox Stebbins, principal at Armand R. Dupont School, one of the six

participating schools. "It would be wonderful to see lighter backpacks," she said.

Pupils will return the laptops at the end of the school year for use by the next class of seventh-graders.

Michigan also is in the process of rolling out its version of a statewide laptop program. Because of recent budget cuts, however, the extent of that initiative--which lawmakers have dubbed Freedom to Learn--is still uncertain.

See these related links:

Great Maine Schools Project
http://www.mitchellinstitute.org/Gates

Report: "One to One Laptops in a High School Environment"
http://www.mitchellinstitute.org/PCHSinterimrpt.pdf

Wireless Writing Project
http://www.prn.bc.ca/Wireless_Writing_Program.html

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Test scores fuel laptop debate

From eSchool News staff and wire service reports
August 19, 2004

Eighth-graders' scores on Maine's most recent annual achievement test are refueling the debate over that state's groundbreaking effort to give laptop computers to students.

Middle-school students who used laptops for two years performed about the same on a standardized test as students in the past who did not have access to computers, the results indicate--though laptop-equipped students did show gains in writing.

Critics of the state's laptop initiative say the scores are the first real evidence the program, which has cost the state more than $15 million so far, is an expensive fad. Proponents say it's too early to expect dramatic changes in test scores.

The laptops had been in use for only three semesters--and were new to eighth-grade teachers--when the tests were taken.

Rep. Glenn Cummings, D-Portland, co-chairman of the state Legislature's education committee, said his own classroom observations convinced him that laptops are an effective teaching tool, especially for struggling students. He also said teachers are still learning how to integrate the new technology.

"I am surprised we did not see a larger leap. But we are still on the leading edges of that learning curve," he said.

Scores for reading, writing, math, and science in the Maine Educational Assessment were essentially unchanged among eighth-grade students in the past school year, compared with the scores of eighth-graders the previous two years.

But there was a measurable improvement in writing scores among students who took the online version of the test at 60 schools, said Patrick Phillips, deputy education commissioner in Augusta.

Next year, the state education department will take a closer look at the differences between test results of students who take the test online and those who take the test with pencil and paper, he said.

Maine has just completed the second year of a four-year, $37.2 million contract that provides laptops to all 34,000 seventh- and eighth-grade

students and to 3,000 middle school teachers.

Previous research on the laptops was based on observation and surveys. The assessment scores are the first concrete data showing whether laptops are helping students, said Dugan Slovenski, a Brunswick parent and school board member.

"At the end of the day, if it doesn't change how much kids know and are able to do, it's just an expensive program to teach kids how to use a computer," she said.

Though early evidence of the Maine program's success has been largely anecdotal, schools in other areas have reported more tangible results. A school laptop program in British Columbia, Canada, for example, was shown to have raised the percentage of students who met the province's writing standards from 70 percent to 90 percent. (See "Studies validate laptop programs in U.S., Canada.")

Maine Education Commissioner Sue Gendron is working to expand the state's laptop program into high schools. This fall, at least 33 school districts will pay $300 per student every year for four years to put computers on the laps of ninth-graders.

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The New York Times
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September 9, 2004

The Tablet PC Takes Its Place in the Classroom

By THOMAS J. FITZGERALD

TABLET PC's have been around for almost two years now, and while they have not yet proved to be the revolutionary change agents that they were billed as in November 2002, they are starting to carve a niche for themselves in certain corners of the digital world.

Industries like health care and insurance have embraced tablet PC's, which can speed the processing of records and forms. While tablets, which account for only about 1 percent of the market for notebook computers, are still generally more expensive than laptops with comparable specifications, prices have started to fall. And last month, Microsoft released an updated version of its Windows XP Tablet PC operating system that offers improved handwriting recognition, addressing one of the chief complaints about the earlier version.

But perhaps the most promising area so far is in the classroom, a setting in which portable devices with handwriting capabilities would seem to make sense. Educators at a handful of schools, many of them private high schools, are pressing ahead with plans to issue students tablet PC's for use in English, foreign language, math, science and social studies classes.

At some schools, the hope is to do away with paper notebooks, on the way to eliminating as much paper as possible. In that vision, students would take tests electronically, read their textbooks online and send their homework by e-mail. Proponents say the devices can improve interaction among teachers and students and increase opportunities for critical thinking by cutting down on busywork.

One factor that favors educators is that students seem to like tablets, especially the pen-based interface that takes the place of a mouse and keyboard.

"That was undoubtedly the best and coolest part," said John Stanton, a senior last year at Cathedral Preparatory School in Erie, Pa., who took part in a pilot program to test the devices.

Mr. Stanton, 18, was on the school's debate team, and he used a tablet PC to take notes and prepare responses during debates. He said the tablet kept pace with swift handwriting and was useful because he could quickly call up his writings from earlier rounds.

Administrators at Cathedral Prep had initially considered laptops, but switched to tablet PC's after early testing by staff members. "We did not want to get caught up with the novelty of this thing," said the Rev. Scott W. Jabo, headmaster at Cathedral Prep. "The more we were using it, we saw a lot of practical uses."

Cathedral Prep issued tablet PC's to 160 ninth graders when they started classes this month, with the goal of eliminating paper notebooks and centralizing study materials on a device linked to the school's wireless network. The device chosen by the school, a model from Acer, has a 10-inch screen and

weighs about three pounds. Like most consumer tablets, it includes a standard keyboard and can function as a laptop when the screen is repositioned.

School officials said they paid $1,350 per device, which included volume and education discounts. Students will be charged a technology fee, to be added to tuition over four years, to cover the cost of the device plus warranties, software and a book bag.

Tablet PC's run essentially the same Windows-based programs as other computers. But instead of a mouse, there is a stylus, or pen, that can be used for navigation by touching the screen. The pen also can take the place of the keyboard; users can handwrite directly in programs, using an on-screen input panel, or by tapping letters and numbers on an on-screen keyboard. Programs designed specifically for the tablet PC, like Microsoft's Windows Journal, enable freeform handwriting that can be converted to text or saved in the original "digital ink" format.

Beyond using them for taking notes and reading, some schools have developed detailed plans to integrate tablet PC's into their curriculums. At the Benjamin School, a private day school in North Palm Beach, Fla., eighth graders tested the devices last year in history and English, while teachers had their own units so they could explore ways to integrate them in all subjects.

This year all ninth graders at the school, about 100 students, will be using their own tablets, a model from Gateway with a 14-inch screen, in all of their classes. The school has a new campus with a wireless network; students and teachers will have access to collaborative software, interactive whiteboards at the front of the class and classroom management tools, as well as the Internet and personal file-storage space.

Using Tablet PC's in allows teachers to go beyond conventional teaching methods, said Barbara Murphy, co-chair of the school's technology committee and a 10th-grade chemistry teacher. Instead of standing at the front of the classroom and talking, Ms. Murphy said, teachers can oversee students' work on projects. "We want students to be actively involved," she said. "The tablet PC seems to really facilitate that."

For example, using one piece of software, a peer-to-peer program called Groove Virtual Office from Groove Networks, students and teachers can collaborate on projects in the classroom from home or anywhere there is an Internet connection. The program, geared mainly for businesses, also has features designed for tablet PC's.

Using Groove in a math class, for example, a teacher could write out an equation in a shared workspace that is displayed on the classroom's whiteboard, and students seated at their desks can use their tablet pens to take turns adding steps to it. "It's like having 20 kids standing at a blackboard, each with chalk in their hands," said Ken Didsbury, academic dean and an English teacher at the Benjamin School.

Students who tested the devices last year said the pen capabilities were sufficient for note-taking. "It writes just like a pen and paper," said Shohan Shetty, 14, who is entering the ninth grade this year. "It's fast."

William Fraser, 14, also used the device last year. He said a strong feature was having Internet access at his desk for fast research. William also said he found the pen to be useful. "About half the class wrote with the pen because they weren't completely used to typing," he said. "And if you want to make a diagram, you just draw with it."

Classroom management software also figures in the Benjamin plan. Using a program called SynchronEyes, from Smart Technologies, teachers can poll students anonymously to determine if subject matter is being understood. Teachers can also view the students' screens to catch instant messaging or to administer electronic testing. "It's a little Big Brotherish, but it allows us to be sure that when we give a test electronically, the kids can't cheat," Mr. Didsbury added.

Students were required to purchase the tablets before the start of the school year; the cost was $1,925 plus $167 for insurance, school officials said. The price, which the school negotiated with Gateway after comparing three manufacturers' offerings, included bundled software like Microsoft Office 2003, Microsoft OneNote and an antivirus program.

Teachers say they feel energized by the challenges and opportunities presented by tablet PC's. Linda Willich, a social studies teacher at the Benjamin School, is preparing a new system for students to organize their work. She says she is looking forward to the collaboration tools and pen capabilities for drawing graphs.

"I can see huge possibilities for it, especially in economics," she said. "There are all kinds of things we haven't even anticipated that will not only be challenges, but will be exciting."

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BACK-TO-SCHOOL ISSUE

When Gadgets Get in the Way

By LISA GUERNSEY

NOW that computers are a staple in schools around the country, perhaps the machines should come with a warning label for teachers: "Beware: Students may no longer hear a word you say."

Today 80 percent of public schools have high-speed Internet access in at least one classroom, according to Market Data Retrieval, an education research company. Among colleges, 69 percent have classroom Internet access and 70 percent have wireless networks. Students start tapping away behind laptop lids with no way for professors to know if they are taking notes or checking Hotmail.

"I've never been in a lecture where I haven't seen someone checking their e-mail when they were supposed to be doing stuff," said Bill Walsh, a student at the Massachusetts Institute of Technology. Instant messages, news tickers and games like solitaire beckon too.

Joe Huber, the technology coordinator for the public schools in Greenwood, Ind., said that teachers routinely complain about gadget-distraction among students. "It is a huge problem with anyone who teaches with any kind of technology," he said.

Even in rooms without computers or Internet access, students have other devices to draw their attention away from academics. Cellphones may be prohibited at many schools, but that doesn't stop students from putting them on vibrate and trading text messages under their desks. That is, when they aren't fiddling with their organizers or music players.

Teachers have started to fight back. All agree that the best weapon against attention deficit is the same one that worked before the dawn of computers: strong teaching. But new strategies don't hurt, either. Some teachers have found, in fact, that the best defense against the distractions of technology is other technology. Here are five examples of teachers who are fighting fire with fire.

Polishing Skills Through Games

Anyone who stepped into Mark Greenberg's class at Camelback High School in Phoenix last year probably saw an entire class of students immersed in computer games. That's the way Mr. Greenberg wanted it: He designed the games to keep his students focused.

Mr. Greenberg, who will teach English at North High School in Phoenix this fall, has written dozens of games. He said that when he gave them to his remedial students last year, their scores improved on the state's English test. His library also includes Jeopardy-like games to train students for the Academic Decathlon, a student contest.

Mr. Greenberg said he had heard the criticism that educational games are nothing more than "drill and kill."

"But now we're finding we're not drilling the kids enough, because they don't know the vocabulary or don't have the computational skills," he said. "So there is a resurgence back to drill and practice."

When he sees a skill in need of polishing, he works over the weekend to program a new game, like a multimedia quiz on comma placement or the multiplication of polynomials. One of his early creations required students to fill in blank speech balloons from Calvin and Hobbes comic strips, as a way of teaching dialogue.

One of his newest games is based on the role-playing card game called Magic: The Gathering. It requires students to "dress" historical figures with qualities that best fit their names (like adding the "poet" quality to John Keats). The game then pits one student's character against another to do battle and see whose attire wins the day.

He can almost understand, he said, when students get distracted in computer labs where the machine is reduced to a "really expensive typewriter." "There are a lot more discipline problems when you tell kids, 'Now type this up on the computer,' " he said. "I mean, how boring can that be?"

Vintage Curiosities

Nancy Kemp, a drafting teacher at Cairo High School in Cairo, Ga., has been known to haul out some old technology to seize her students' attention.

A few years ago she set up a film projector and showed a 1956 film about the basics of drafting. She advanced the frames slowly, projecting the images onto a white board, pointing out techniques and making annotations with dry-erase markers. "These kids had never seen film strips," she said. "I had that whole class in the palm of my hand for an hour and a half."

"I don't think I could do it as a steady diet because the newness wears off," she added. But for those three days, she said, "it was just wonderful."

A teacher for 30 years, Ms. Kemp said she doesn't put much credence in PowerPoint - "all pomp with no circumstance," she calls it - and she avoids showing anything on video. "They'll tune it out," she said, adding that the students are already inundated with television images, including scrolling announcements on the monitors at school.

She acknowledges, however, that computers are a must these days. The machines in her room feature Mechanical Desktop 2004, a program used by architects and designers. Of course, the computers also offer the enticement of the Internet.

"I have to be vigilant," Ms. Kemp said. When she notices students using instant messaging software, she waits to make sure that they have closed the program instead of simply minimizing it. But her most effective tactic, she said, is to threaten to reboot the computer without giving the student a chance to hit Save and keep the day's schoolwork. "I'll walk over and say, 'Do I need to reboot?' And they say, 'No, no,' and they do the right thing."

Round Tables and Loud Noises

To keep his students focused, Eric Hudson, an assistant professor of physics at the Massachusetts Institute of Technology, has an ally in his classroom's layout. Instead of tiers of seats, they are all on one level, arranged around 12 round tables. Each table seats nine students and holds three wireless laptops.

If those laptops were used in a conventional lecture hall, students could hide behind the screens. But in this room, professors and teaching assistants wander, keeping an eye out for students opening Yahoo Mail or 3D Pinball.

"Stealth works," Professor Hudson said.

The classroom layout is part of a larger education project called Technology Enabled Active Learning, which was organized by another M.I.T. professor, John Belcher, two years ago. TEAL, as the project is known, uses collaborative work groups, hands-on experiments, computer simulations and remote controls for instantaneous quizzes and class-wide feedback sessions. Hanging on the walls are white boards and projection screens for discussions and presentations.

Professor Hudson said he also deploys a high-paced lecture style. "I'll try to cover topics in five- to 10-minute chunks," he said. Anything longer, he added, and "there is more of a chance that they'll lose what you're talking about and will turn to IM-ing their friends."

Sometimes in his demonstrations he will make a capacitor blow up, with its bang reverberating down the hall.

"You have to make loud noises once or twice to snap them back to attention," he said.

Large physics lectures typically have a high rate of failing students, partly because so many enrollees never bother to show up. "It used to be that the fail rate for this course was 15 percent," he said. "When we went to this format, it dropped to 1 percent to 2 percent." And what about attendance? It's up to 100 percent, he said.

An Onscreen 'No No'

It doesn't take long for the students in Donna Lee's class at the North Gulfport Seventh and Eighth Grade School in Gulfport, Miss., to realize that the computers at their desks are not under their control.

Ms. Lee, who teaches keyboarding and Microsoft Office skills, uses networked software called NetOp to take over a student's computer screen whenever she sees fit. Her desktop computer has a master control panel that enables her to see thumbnail images of every screen in her lab. If she spots an unauthorized Web site, she clicks a button to freeze the student's screen. Using her mouse like a red pen, she writes "No No" across the screen. The scolding suddenly appears on the student's screen too.

"The kids turn around and look at me," she said. "I give them a look, and they get off there real quick."

Ms. Lee also uses the software to rein in all of her students at once. "If I want to explain something, I can freeze every screen," she said. "And in big neon letters I say, 'Pay Attention.' " Without the software, she said, she could ask students to turn to face her and turn off their monitors, but not everyone would obey.

To Ms. Lee, the Web demons that beckon to her students are online chat rooms - "the horrible, horrible

teenage chat rooms" - where people can post anonymous notes, sometimes in foul or graphic language, about anyone they know.

Using NetOp, she can record exactly what a student has been viewing and for how long. "I save it to my hard drive and put 'No No' on it and call a parent conference, with the student there," she said. A student might plead that he just looked for a second. But, Ms. Lee said, she can open the file and say, "Let's look where you went."

Zooming In on Details

When Greg Malone takes charge of his science classroom at Capital High School in Santa Fe, N.M., he takes a tip from talk show hosts. With a tiny microphone pinned to his collar, he walks between tables, asking questions about what he has projected on a six-foot-wide screen in front.

"If you can amplify your voice but still speak in a normal conversational voice, the children can actually concentrate better," he said. "There is a focus."

He carries a cordless keyboard and mouse so that he can project new images from his desktop computer no matter where he is standing. Using a list of Web sites that he calls up before class, he bounces from one site to another.

The projector's zoom function is a favorite tool. Mr. Malone said he pulls up images from the Hubble Space Telescope and zooms in on tiny galaxies that would be a strain for the students to see otherwise. In texts on the screen, he zooms in on numbers and words. "I watch their faces," he said. "They are absolutely riveted."

Mr. Malone, who used to work in the computer gaming industry, hands out remote controls, too. By pressing buttons, students can respond immediately and simultaneously to quizzes on the day's lesson. Their answers are tabulated wirelessly, and the totals are projected for all to see.

"We'll suddenly stop, and I'll flash a question on the screen and I'll say 'Respond to this,' " he said. "If there is anything that these kids relate to, it's holding a remote control in their hands."

Still, Mr. Malone said that working in a classroom with computers creates problems that even high-tech props cannot solve. Teachers, he said, have to be constantly watching for students who "drift off."

"It's more than just e-mail. It's looking at Web sites with cars, with sports, playing games," he said. "As a teacher, you have to have those antennas up."

District Administration > A Tale of Two Laptops

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A Tale Of Two Laptops

Two different states, two different outcomes. When it comes to state-wide laptop adoption programs, one state did it right, the other is still floundering. Find out why

by Ron Schachter

On this page

For those who envision laptop computers in the hands of every student, this may be the best of times and the worst of times. While classrooms using this approach are churning out success stories, growing state budget deficits are threatening future funding, leaving educators to wonder whether laptops for everyone is a great idea that they simply can't afford.

A four-year, $37-million initiative to provide laptops to all seventh and eighth graders in Maine has transformed middle school classrooms there and generated positive reviews. At the same time, the state's budget crunch has left the program's longer-term future up in the air. In Michigan, a plan to equip the state's sixth graders with laptops recently lost more than half of its $39 million funding before it could get started, thanks to an almost $1 billion state budget shortfall.

Top

Maine's Best Seller

The harsh economic news does not surprise Chellie Pingree, the president of the government watchdog group Common Cause and the former majority leader in Maine's State

Senate. Pingree was an early opponent of Maine's laptop program and says that paying for it was the legislature's biggest concern.

"There just wasn't enough money, and we were behind in school construction and general purpose aid to education," Pingree recalls. "There were cartoons in the paper of students holding laptops over their heads under leaky roofs in school buildings."

Eventually Pingree reached a compromise with then-Gov. Angus King, the patron of the laptop program. Now in its second year and known as the Maine Learning Technology Initiative, it connects the state's 34,000 seventh and eighth graders and their teachers to a wireless network. And according to administrators around the state, it already has lived up to its promises of better engaging those students in learning and leveling the academic playing field for Maine's many rural and underserved districts.

"Equity is a huge thing for us, and this program has gone way beyond what we even dreamed could happen," says Paula Smith, the principal of Pembroke Elementary School in Maine's rural northeastern corner. Smith's school is so small that its 25 seventh and eighth graders share the same classroom. Since the start of the laptop program, their scores in reading, writing and math have improved enough to remove Pembroke from Maine's list of underperforming schools. Afterschool detentions have almost become obsolete.

"The laptops are integrated in the classroom all day long, and the students have become totally self-directed, independent learners." Smith points out. "There's a community and family atmosphere. There is peer learning going on. These were kids without confidence who wouldn't have stood up to make a presentation. Now, they're asking to stand up."

During recess, students use their laptops to track portfolios in a stock market simulation contest. Pembroke's students recently finished first among middle schools in both the state and the country. Smith adds that the entrepreneurial, technological and problem-solving skills that they are developing through the laptop program will serve them and their community in the long run.

"We're so economically deprived, and these kids are starting to sense that, economically, they can make a difference as adults here," explains Smith. "They were even talking about developing a CD of dynamic photos that would promote our county to bankers, realtors, to mortgage people. It's a small step, but kids here are thinking that way."

In more populous Freeport, Maine, middle school principal Chris Toy says students are using their laptops as

combination textbooks, writing tools, reference libraries (students can connect to a database of newspapers, periodicals and encyclopedias) and multimedia vehicles for creating class projects.

"It's one-to-one access. It's personalization of instruction that's in control of the person who's learning. That's what we do as adults," Toy observes, adding that the laptop program al-ready has become a high priority at the Freeport Middle School.

"It's right up there after having enough qualified, competent teachers," he says. "After that, it's about getting the tools to empower students and teachers, and this is one of the most powerful tools. The laptop initiative and the way it was implemented have had the most profound impact on teaching and learning of any initiative that I've seen in 26 years. And it isn't just about the technology."

"We've always realized that this is about education," agrees Tony Sprague, the project manager for the Maine Learning Technology Initiative. "The goal was to make the laptop program a critical part of the education system in Maine instead of an accessory that people would not know how to relate to. It was really based on many conversations with educators over what would work in their classroom."

The program was also a long time in the making. In 2000, a task force of educators and legislators began hammering out the specifics, tying the use of laptops to Maine's state learning standards, and scaling back an original plan to supply laptops to all of Maine's high school students as well.

The $37 million of federal and state funds Maine is spending over four years comes out to $300 per student. A deal with Apple Computer provides a complete package of services, from providing iBooks to creating wireless networks in schools to training teachers. Private contributions, including $1 million from the Bill and Melinda Gates Foundation, are helping teachers integrate the new technology in different content areas.

And Sprague is looking to provide inexpensive Internet connectivity to student homes lacking it.

Along the way, the Learning Technology Initiative has drawn interest from New Hampshire, New Mexico, Texas, Pennsylvania and California, as well as an international contingent that has since implemented similar programs in Scotland and Australia.

In a state study of the Maine program's first year, in which only seventh graders received the computers, almost 83 percent of the students said that the laptops improved the quality of the work and 89 percent said the computers made school work more fun. These and other positive effects have fended off attempts in the legislature to cut money from the program and have left Sprague focused on 2005, when funding expires.

"The reality is that budgets are tight from the local school level to the state level," he admits. "There are always competing priorities for legislators.

But anytime there are questions raised about funding the laptop program, they're hearing from principals, teachers and parents, who say this is very important for my school, for my classroom, for my son or daughter. We're building a constituency that legislators are hearing from."

Former legislator Pingree says the program she once opposed now has her vote, even if economic times are tough. "While every state has to decide whether they can drain the funds from somewhere else that is important, there's never going to be a good day for setting aside money for a bold idea like this," she says. "But I think the benefits are well worth it."

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Lost in Translation

Maine's success story hasn't been repeated in Michigan, which is launching the second statewide laptop program in the country and--because of fiscal and procedural problems--has stumbled coming out of the gate. Like the Maine Learning Technology Initiative, Michigan's Freedom to Learn Program targets middle school students--the state's 132,000 sixth graders--at $250 per student (with an additional $25 paid by schools), compared to Maine's $300 (covered entirely by the state).

"Sixth grade for many school districts is when students get lost in the shuffle, may achieve less, and become less engaged," explains Bruce Montgomery, Freedom to Learn's director. "And that appeared to be the time to get involved."

The laptop program was well-received at 15 pilot sites during the 2002-2003 school year. The state had already distributed 88,000 laptops to its teaching force a few years earlier. And the student version had strong support in Michigan's legislature, which last summer combined $17 million in federal funds with $22 million from the state to pay for the first year of the program.

By Christmas, though, Michigan's Gov. Jennifer Granholm had taken back the state money in order to finance Michigan's cash-strapped prison, mental health and prescription drug programs. Montgomery figures that only about 20,000 students at high-need schools and schools failing to meet Annual Yearly Progress standards will get laptops next year.

But that's just part of Michigan's cautionary tale. It did not help, say critics, that the program's rollout during the fall of 2003 was bumpy from the start.

"There were so many drawbacks," recalls George Brackx, the supervisor of technology systems for the Southfield Public Schools. "Maine spent two years planning. But some politicians here were making promises without giving us an idea of how our program was supposed to work."

For starters, it was not clear what costs districts would have to bear. "Publicly they were telling parents, 'We're giving you free computers,' but there were hidden price tags," Brackx says.

While the $25 per student annual charge meant $25,000 for Southfield in the first year, that amount would multiply if--as envisioned--the laptop program grew to include all middle and high school students. The district would incur the professional development costs for teachers to integrate the technology into the curriculum. And Brackx worried about the resources he would need to double the number of computers on his network and go wireless.

School officials around the state were still haunted by the delivery of laptops to all Michigan teachers several years earlier. "That was a one-time spending initiative, and there was not much follow up," says Matt Resch, the spokesman for Michigan House Speaker Rick Johnson, who championed the legislation for student laptops. "The feeling among schools was, 'Here we go again. Take us off your list.' "

Meanwhile, concerns about the educational value of universal laptops--concerns that had only simmered during Maine's adoption of its program--boiled over in Michigan. Teachers and principals questioned whether sixth graders could be entrusted with expensive equipment or expected to do more than play video games and send e-mail to each other.

The state also delayed for months before contracting with Hewlett Packard for a package of hardware and services similar to Maine's deal with Apple. By then, too many concerns had gone unaddressed for too long. Barely 150 of Michigan's almost 500 school districts signed up for the voluntary program.

"It wasn't that any of these things were insurmountable," Southfield's Brackx concludes, "but we never had a chance to figure them out."

With future state support in doubt, Freedom to Learn Director Bruce Montgomery and House Speaker Johnson promise to explore alternative models for funding Michigan's fledgling program.

Top

The Finances

When it comes to paying for large-scale programs, some models exist on district levels, including a suburban Chicago district that has financed laptops through property taxes and a small New Hampshire pilot program that depends on private funding.

In Virginia's Henrico County, which encompasses urban and suburban Richmond, Superintendent Mark Edwards has dedicated about 2 percent of his $356 million annual budget to supply Apple iBooks to the nearly 24,000 students and 3,500 teachers and support staff in grades 6-12.

Edwards talks about Henrico County's laptop program in business terms and says that his multimillion-dollar investment is achieving better returns than earlier investments in computer labs and desktops. The positive results include increased achievement (100 percent of the district's schools now meet Virginia's full accreditation standards compared to 70 percent when the laptop program began three years ago) and

substantial savings on calculators, periodicals, maps, and reference books--all of which are now available via computer.

Henrico's high school students also have SAT preparation programs installed on their laptops and last year realized a 13-point gain and the highest average scores in the district's history. ESL students, meanwhile, have been taking their laptops home and teaching their parents English.

"Students use the laptops 12 hours a day," Edwards points out. "We're seeing hundreds and thousands of them log on at night. They're instant messaging each other, and they're listening to music. But they're also doing homework, and they're learning."

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Bradenton.com

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Bradenton HERALD | East Manatee HERALD

Panel wants laptops for every student

MICHAEL BARBER
Herald Staff Writer

MANATEE - Florida's public schools need to start equipping students with laptop computers to prepare them for the future, according to an education task force report released Monday in Manatee County.

Tina Barrios, supervisor of instructional technology for Manatee County schools, chaired the Laptops for Learning Task Force, which consisted of 15 educators from across the state. The task force was established in October by state Education Commissioner Jim Horne.

Barrios said the task force carefully examined Florida's technological resources to determine if the state's public schools are ready for laptops in the classrooms.

"We spent a significant amount of time looking at what the state of Florida has done up to this point and whether we are ready," Barrios said. "Overwhelmingly, what came out in the report was that the infrastructure, the amount of money that the state has put into technology over the course of several years, and the network infrastructure to support the educational environment was adequate for us to begin to move forward."

The task force studied laptop pilot programs across the country to find out what works and what doesn't work. Barrios said the look at other programs helped the task force form its recommendations.

"We tried to take the best of the best, because certainly some of the laptop initiatives were not as successful," Barrios said. "In some cases, what they did was find a pot of money and dumped the laptops in the schools but they didn't have the infrastructure to support it, they didn't have professional development, they didn't have buy in from the staff and they didn't have a good implementation plan.

"What we're saying as a task force is you have to have all of these different parameters in place to do this successfully."

One of the recommendations made by the task force was to create a "research team" of academic experts from Florida's universities to design and oversee the implementation of the program.

Although Barrios said she couldn't tally a total cost for the laptop initiative, she said the state could use its collective buying power to purchase laptops at a discount, perhaps cutting the cost of an individual laptop in half.

Barrios was instrumental in establishing a pilot program that issued laptop computers to students in 22 classrooms in Manatee County over the last several years. Earlier this school year, the local school district devoted $2.2 million to make Bayshore High one of the first high schools in the state to make laptop computers available to every student.

Bayshore Principal David Underhill said it's critical for schools to provide the best technology training possible.

"Businesses are already way ahead in technology," Underhill said. "Go to any professional office, and you'll find they are using all types of technology. Education is just catching up to that, and we have to catch up so we can create a work force that is ready for the society they will be working in."

For more on this story, watch BayNews 9.